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CONTROL WORK

in the

EASTERN STATES

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WHITE PINE BLISTER RUST CONTROL IN NORTHEASTERN REGION

ANNUAL REPORT FOR 1948

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United States Department of Agriculture
Bureau of Entomology and Plant Quarantine
Division of Plant Disease Control
Blister Rust Control
208 Federal Building
Cambridge 39, Massachusetts

INDEX TO ANNUAL REPORT OF BLISTER RUST CONTROL

ACTIVITIES AND ACCOMPLISHMENTS IN NORTHEASTERN REGION DURING 1945

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WHITE PINE BLISTER RUST CONTROL IN NORTHEASTERN REGION

ANNUAL REPORT FOR 1945

FOREWORD

This report summarizes blister rust control accomplishments during the calendar year 1945 in the Northeastern Region on the basis of the uniform financial and work projects which were adopted by the Bureau in 1942.

Part I of the report is a general statement indicating the importance of white pine in the region, distribution and spread of the rust, control accomplishments during 1945 on the basis of regional totals and a concise summary with charts showing the present status of various phases of the control program.

Under Work Project BLR-1-1, the Bureau is responsible for leadership, coordination and technical direction of all white pine blister rust control activities in the Northeastern States, while Work Project BLR-3-1 includes all cooperative blister rust control work on state and privately-owned lands in the region. Activities and accomplishments under these two work projects are outlined in Parts II and III, respectively, of this report.

Control activities on national forests and parks, involving Financial Projects BLR-4 and BLR-5, are summarized in Parts IV and V.

The Appendix includes statistical summaries of accomplishments during the current year and accumulative results for the period 1918-1945, inclusive, and detailed information on the status of various phases of control work such as ribes eradication, control area mapping, nursery sanitation and Ribes nigrum elimination.

PART IGENERAL STATEMENTImportance of White Pine in The Region

During the 12-year period 1927 to 1938, inclusive, the average annual production of white pine lumber in the Northeastern Region (comprising the New England States, New York, New Jersey and Pennsylvania) was 277,014,000 board feet. Due to the hurricane of September 21, 1938 and to the increased demand from Europe for lumber and other supplies in connection with the early war efforts, the annual production of white pine lumber in the region rose to 457,548,000 board feet during 1939 to 1941. From 1942 to 1945, during our active participation in the war, such production jumped to an average of 797,167,000 board feet per year.

White Pine Lumber Production (Board Feet) in Northeastern States

<u>Period</u>	<u>Normal Cut*</u>	<u>Total</u>	<u>Actual Cut</u>	
			<u>Yearly Average</u>	<u>Accelerated Cut</u>
1939 - 1941, Incl.	831,042,000	1,372,644,000	457,548,000	541,602,000
1942 - 1945, Incl.	1,108,056,000	3,188,669,000	797,167,000	2,080,613,000
1939 - 1945, Incl.	1,939,098,000	4,561,313,000	651,616,000	2,622,215,000

*Based on yearly average of 277,014,000 board feet for period 1927-1938.

Assuming 5,000 board feet of lumber were produced per acre, a figure ascertained to be representative in New Hampshire, a yearly average of 55,403 acres of white pine was cut in the region during the period 1927 to 1938, inclusive. On the same basis, a total of 912,263 acres of pine was logged from 1939 to 1945, inclusive, of which 524,443 acres, or 57.5%, represented accelerated cutting. These acreage figures are conservative, since they represent only the pine which was cut for lumber and reported to state and federal authorities.

Investigations have shown that soil disturbances due to logging and other causes are primarily instrumental in causing a regeneration of ribes from seeds stored in the forest floor. Therefore, the logging of 912,263 acres of white pine during the period 1939 to 1945 has increased our control problem in this region, since most of this pine had been protected. It is now necessary to re-examine this acreage to determine the amount and extent of regeneration of white pine and ribes. The small amount of work already done in this respect indicates a high percentage of the affected areas are restocking adequately to white pine and in many of them a dangerous amount of ribes regrowth has occurred which must be destroyed to protect the pine. Many areas show a considerable amount of recent infection on the young pine reproduction. The problem is further increased by the necessity of working adequate protection zones around these pine areas.

Data on white pine lumber production 1927 to 1937 taken from Statistical Bulletin No. 70, USDA, Feb. 1940. Similar data for 1938 to 1944 derived from reports by Bureau of Census, U.S. Dept. of Commerce. The figure for 1945 was estimated, being based on a reduction of 15% in the amount given for 1944 in Census report.

The extent to which pine owners in the Northeastern States responded to the all-out lumber production effort is reflected in the figures for the total cut for 1943 as compiled by the Bureau of The Census, U. S. Department of Commerce. In that year, the last one for which we have complete data for the entire country, the total cut in the nine Northeastern States amounted to 735,418 M. board feet. This constituted 70.4% of the total production of eastern white pine and 44.0% of all white pine lumber produced in the United States that year. On the basis of average stumpage and log prices in the several states, the total stumpage value of the cut in the Northeastern Region is estimated at \$5,161,830 and the total value on the basis of log prices amounted to \$16,469,270. Based on average prices at the mill, the white pine lumber produced in the Northeastern Region during 1943 and a total value of \$26,511,116.

Heavy cutting of white pine continued during 1944 and 1945. A total of 905,784,000 board feet of white pine lumber was produced in the Northeastern Region during 1944. Maine and New Hampshire led all states in the amount of white pine lumber produced that year and New York, Vermont and Massachusetts were well up on the list. Data on the amount of white pine lumber cut during 1945 are not yet available. It is, however, estimated that the amount will be about 15% less than in 1944. Efforts have been made by representatives of federal and state forestry agencies to avoid logging practices that will jeopardize the immature trees so important to a permanent lumber supply. As these efforts have been only partly successful, several states are contemplating legislation which will provide for and insure proper cutting practices. In New York, 15 district forest practice boards are being established to determine forest practice standards for their districts, subject to the approval of the state forest practice board and the Conservation Commissioner, and to procure state assistance for cooperating owners of forest and farm woodlands. The district boards will formally adopt such standards and promote their application. In each district there will be a trained forester who will cooperate with owners in the application of approved procedures.

Blister rust control is an integral part of the protective measures that are imperative to the preservation of white pine as an all-important natural resource of the region. The heavy cutting during recent years merely emphasizes the importance of adequately protecting the remaining supply, especially the young growth which is most seriously damaged by blister rust. Under the present program in the Northeast, control is being practiced on a permanent control area of 12,349,683 acres involving 4,189,626 acres of white pine. This pine acreage comprises stands of adequate vigor which meet stocking requirements based upon an expectancy of at least 50 crop trees per acre at maturity. In addition, thousands of acres of merchantable white pine have been discontinued from the control area because little pine reproduction was present or expected on these areas and appreciable damage from blister rust should not occur prior to logging. There are also several hundred thousand acres of white pine which have been eliminated from the control area due to insufficient pine stocking, poor quality, excessive cost of control, too much infection, or because the total amount of pine in a township was not sufficient to justify public expenditures for control work.

The botanical range of white pine includes the entire Northeastern Region but there are relatively large sections, especially in northern and eastern Maine, the northwestern portion of New York, most of New Jersey, and several counties in the southeastern and western parts of Pennsylvania, which are not included in the blister rust control area (see map on Page 6) chiefly because of the scattered distribution of white pine. It is estimated that the total white pine forests in this region (pure stands and mixed stands containing 20-79% white pine) comprise approximately five and a quarter million acres. Over 99 percent of this pine is in state and private ownership, chiefly farm wood lots.

Eastern white pine is also very important from a scenic and recreational viewpoint, as it adds immeasurably to the attractiveness of the region. Before the war, the value of the tourist business in New England alone was estimated at 400 million dollars per year. In addition, white pine has a high value for watershed protection and has been planted extensively for that purpose as well as commercial reforestation.

Pine Infection Conditions

Blister rust has been generally distributed on white pine throughout the Northeastern Region for many years, but the amount of infection varies considerably in different localities due to such factors as the number of original infection centers caused by the planting of imported diseased pine, distribution and amount of white pine and ribes, climatic conditions and the application of control measures. The disease has been found on pine in all counties in the region except 16 in Pennsylvania, 5 non-pine counties in New Jersey, and 4 counties in New York comprising the metropolitan area of New York City. Over extensive areas from 1-20% of the trees have been infected and in many local sections from 30-90% of the trees are diseased. The spread of the rust from ribes to pines has continued in unprotected areas and in those parts of the protected areas that have become reinfested with ribes due to unavoidable delays in scheduled reworkings and to disturbances in the forest floor resulting in the germination of viable ribes seeds stored in the duff. Within the other portions of the protected areas, the prevailing effectiveness of the ribes eradication work in controlling the disease is indicated by the general scarcity of new pine infection and the presence of healthy white pine reproduction.

Most of the younger pines infected prior to initial control work were killed by the rust and have gradually disappeared from the stands. However, damage resulting from early infection of the older and larger pines, which die very slowly from the disease, has become more and more apparent. Many lumbermen and pine owners are now reporting large dead and dying pines, and in many instances they do not realize the infection took place 15 to 25 years ago. Damage of this sort is most prevalent in Warren and Essex Counties, New York, the upper Connecticut River Valley in New Hampshire and Vermont, and in many sections of Maine particularly outside of York and Cumberland Counties. During the period 1940-1945, studies of blister rust damage to merchantable size pines were made in 81 areas located in the three northern New England States and New York. These study plots, comprising 117.5 acres, contained a

total of 16,495 pines with a volume of 1,559,201 board feet, or a per acre average of 140.4 pines and a volume of 13,270 board feet. A total of 7,490 trees, or 45.4% of all the pines, were dead or sure to die as a result of stem cankers. These diseased trees contained 719,117 board feet, or 46.1% of the total volume of all the pines. In addition, about 10% of the total number of pines were infected only with branch cankers which may eventually kill these trees.

Blister Rust Infection During 1945

No extensions of ribes or pine infection beyond their previously known range in this region were reported during 1945. Ribes infection varied from light to heavy, averaging about normal, in spite of an excessive amount of rain during May, June, and July.

Noteworthy examples of new infection on young pine, chiefly in logged areas, were found during 1945 in Raymond, Landaff, New Durham and Grantham, New Hampshire; West Rutland, Pawlet and Waterford, Vermont; Dresden, Maine; Axton in Franklin County, New York and in several townships in Warren and Essex Counties, New York. In the latter two counties, infection studies were made in 13 quarter-acre plots during the fall of 1945 on areas logged during the period 1938-1940. These plots contained a total of 22,232 young pines from $1\frac{1}{2}$ to $2\frac{1}{2}$ feet in height, of which 2,420, or 10.9%, were diseased. In two of the study plots, 40.0% and 45.2% of the pines were infected.

Policy For Control Activities During War and Plans For Post-War Program

During the war period, blister rust control activities in this region were adjusted to meet emergency conditions. A holding program was adopted, the chief objective being to maintain control on as many of the protected areas as possible with the limited manpower available. Labor employed on the control projects consisted chiefly of high school boys and men above the draft age or with slight physical handicaps. In recruiting labor every effort was made not to hire persons who were needed on agricultural work or in war industries. Travel was restricted and purchases of equipment and supplies limited to bare essentials. Thorough planning of each activity in advance was paramount to assure effective results. Some of the permanent personnel were temporarily detailed to aid the Timber Production War Project and assistance was given other war projects wherever practicable.

The states and local cooperators continued to give excellent support to the control program during the war period and in several instances there were increases in the amounts of such cooperation. A total of 1,768,688 acres were cleared of ribes during the war years 1942 to 1945, inclusive, or an average of 442,172 acres per year. This was a commendable accomplishment under the existing conditions.

Detailed plans were prepared covering a proposed program for blister rust control in the Northeastern Region during a five-year period immediately following the war. Under this plan, all necessary control area mapping work would be completed during the first three years. The proposed ribes eradication activities during the five-year period would complete all remaining first

and any necessary second work. This would necessitate working an average of approximately 1,630,000 acres per year which is about 100,000 acres less than the acreage examined in this region during 1936 which was the peak production year under the Emergency Programs. Upon completion of the proposed five year post-war program, practically all of the control area would be on a maintenance basis and it would then be possible to reorganize the program in accordance with future needs. It now appears that the period of the program will have to be increased to 8 or 10 years and plans revised accordingly.

Control Activities During 1945

All blister rust control activities in the Northeastern Region during 1945 were conducted under the Regular Cooperative Program. With the exception of small projects at Acadia National Park and on the Allegheny National Forest, all of the control work was performed on state and privately-owned lands.

The ribes eradication projects in 1945 resulted in 497,247 acres being cleared of 2,147,265 wild and cultivated ribes. This work required 31,607 man days labor. The peak number of laborers employed during the field season was 583. The total acreage cleared of ribes during 1945 included 82,422 acres of first work, 301,585 acres of second work, and 113,240 acres of other workings. Compared with the previous year, there were increases of 20.1% in total acreage cleared of ribes and 7.4% in man days employment, but a decrease of 13.8% in total number of ribes destroyed. This decrease was due to the fact that a greater proportion (83.4%) of total acreage examined in 1945 represented rework.

The environs of 11 nurseries containing 30,471,000 white pines were also examined for ribes in 1945. Only 679 ribes were located and destroyed on the 4,936 acres examined in connection with this nursery sanitation work which required 79 man days labor.

A small amount of blister rust canker elimination work was performed in cooperation with one pine owner in Maine and on state land in Pennsylvania during 1945. A total of 225 pines were examined and 77 fatally infected pines cut down. In addition, 135 branch infections and two stem cankers were removed from 47 other diseased pines. Only 8 man days labor were expended on such activities.

A few temporary laborers were employed on control area mapping work in six states before and after the 1945 ribes eradication season. Several of the district leaders also did some mapping work. A total of 179,805 acres was mapped in detail, approximately 11% of this acreage being mapped by the district leaders.

Ribes nigrum elimination work was not conducted as a special project during 1945, but such bushes were removed in conjunction with the regular ribes eradication projects in all states.

Status of Control Area Mapping

The Emergency Programs during the period 1933-1942 were of great assistance in providing men to make detail maps of blister rust control areas which are essential in planning and executing control activities. However, only a limited amount of pre-eradication survey work has been possible under the Regular Cooperative Program as funds have not been available to hire temporary employees for such activities and the permanent personnel have to spend most of their time during the fall and winter months on informational and service activities to secure local cooperation in applying control measures.

The 1938 and 1944 hurricanes and the extensive cutting of white pine since 1941 have changed forest conditions and the status of control on several hundred thousand acres in the control area of the region. The detail maps prepared prior to 1938 in the affected areas are now of little value and it will be necessary to revise them as soon as funds and personnel are available for such activities. It is now possible to determine whether the areas affected by the 1938 hurricane have restocked to white pine, but in the case of logged areas, reliable information cannot be obtained for at least three years after the cuttings occurred. The cut-over areas are being located on maps as rapidly as possible and these units will have to be examined at a later date to determine whether they should remain in the control area or be discontinued, and the maps revised accordingly. Greater use is being made of aerial photographs in connection with control area mapping work.

The present net control area in the Northeastern Region comprises 12,349,683 acres, of which 8,301,398 acres, or 67.2%, has been detail mapped. All of the control area in Connecticut has been mapped and the towns east of the Connecticut River which were affected by the hurricane are being re-mapped. Numerous changes have occurred in the pine types in these towns, but there has been very little change in the total pine acreage in the few towns where the remapping work has been completed. In Vermont, 96.4% of the control area has been detail mapped, but little remapping work has been done in the sections along the Connecticut River Valley where most of the hurricane damage occurred. The unmapped acreage in the control area of the region totals 4,048,285 acres of which 60.7%, or 2,459,358 acres, are in the States of New Hampshire and Massachusetts. Many of the areas which have not been detail mapped were initially cleared of ribes prior to 1933 when spot maps were prepared, usually on U.S.G.S. sheets, to show the location of the white pine types and the boundaries of the control areas.

Chart No. 1 shows the percentage of the present net control area that has been detail mapped in each county in the Northeastern Region. In many of the Pennsylvania counties shown as partly completed, most of the white pine areas have been mapped in detail, but not the protection zones.

CHART NO. 1 - CONTROL AREA MAPPING - NORTHEASTERN REGION

STATUS OF DETAIL MAPPING 1945

(SYMBOLS SHOW THE PROPORTION OF EACH COUNTY IN THE DIFFERENT WORK CLASSIFICATIONS, NOT THE ACTUAL LOCATION OF THE WORK.)

LEGEND

CONTROL AREA	12,349,683 ACRES
MAPPED	8,301,398 "
NOT MAPPED	4,048,285 "

SCALE OF MILES
0 20 40 60 80 100

Status of Ribes Eradication Work

The present net control area in the Northeastern Region comprises 12,349,683 acres, of which 10,687,779 acres, or 86.5%, has been given initial protection. Second work has been performed on 4,596,968 acres or 37.2% of the net control area. In addition, 648,332 acres have been worked three times. At the end of 1945, a total of 2,880,993 acres, or 23.3% of the net control area was classified as being on maintenance since the ribes in these tracts are so scarce that danger from blister rust is negligible for an indefinite period. The area on maintenance was increased by 262,459 acres during 1945 and there are several hundred thousand additional acres which undoubtedly could be so classified, but field inspections will be necessary before such action can be taken. All of the control areas in Rhode Island and New Jersey are on a maintenance basis, while in Connecticut and Massachusetts, the percentages are 99.4% and 53.8%, respectively. In the other states, from 10.3% to 17.5% of the control areas are now on maintenance.

At the end of 1945, it was estimated that there were 5,803,357 acres, or 47.0% of the net control area, which should be examined to determine the need for rework. This includes a large acreage affected by the 1938 and 1944 hurricanes and hundreds of thousands of acres which have been logged since 1941. Field inspections indicate that a high percentage of these areas are reverting to white pine and in many cases the amount of ribes regrowth and resulting new pine infection show the need for prompt application of control measures.

Over 99.8% of the control area in this region consists of state and privately-owned lands, chiefly farm woodlots. Tables 35 and 36 in the Appendix list detail information on the status of control work by districts, states, and land ownership classes.

Charts II and III show the status of the first and second ribes eradication work in the region, by counties, while Chart IV depicts the percentage of the net control area in each county that is now on a maintenance basis.

These charts, as well as Chart I, are the same as used in our 1944 annual report, but with adjusted acreage figures. However, no attempt was made to correct the symbols, as the changes in the percentage of the control area worked and on maintenance in each county were relatively small (less than 5%) except in a few instances. New charts will be prepared in 1946.

CHART NO. II - RIBES ERADICATION - NORTHEASTERN REGION

STATUS OF FIRST WORKING 1945

(SYMBOLS SHOW THE PROPORTION OF EACH COUNTY IN THE DIFFERENT WORK CLASSIFICATIONS, NOT THE ACTUAL LOCATION OF THE WORK.)

LEGEND

~	CONTROL AREA	12,349,683 ACRES
▨	WORKED	10,687,779 "
▩	NOT WORKED	1,661,904 "

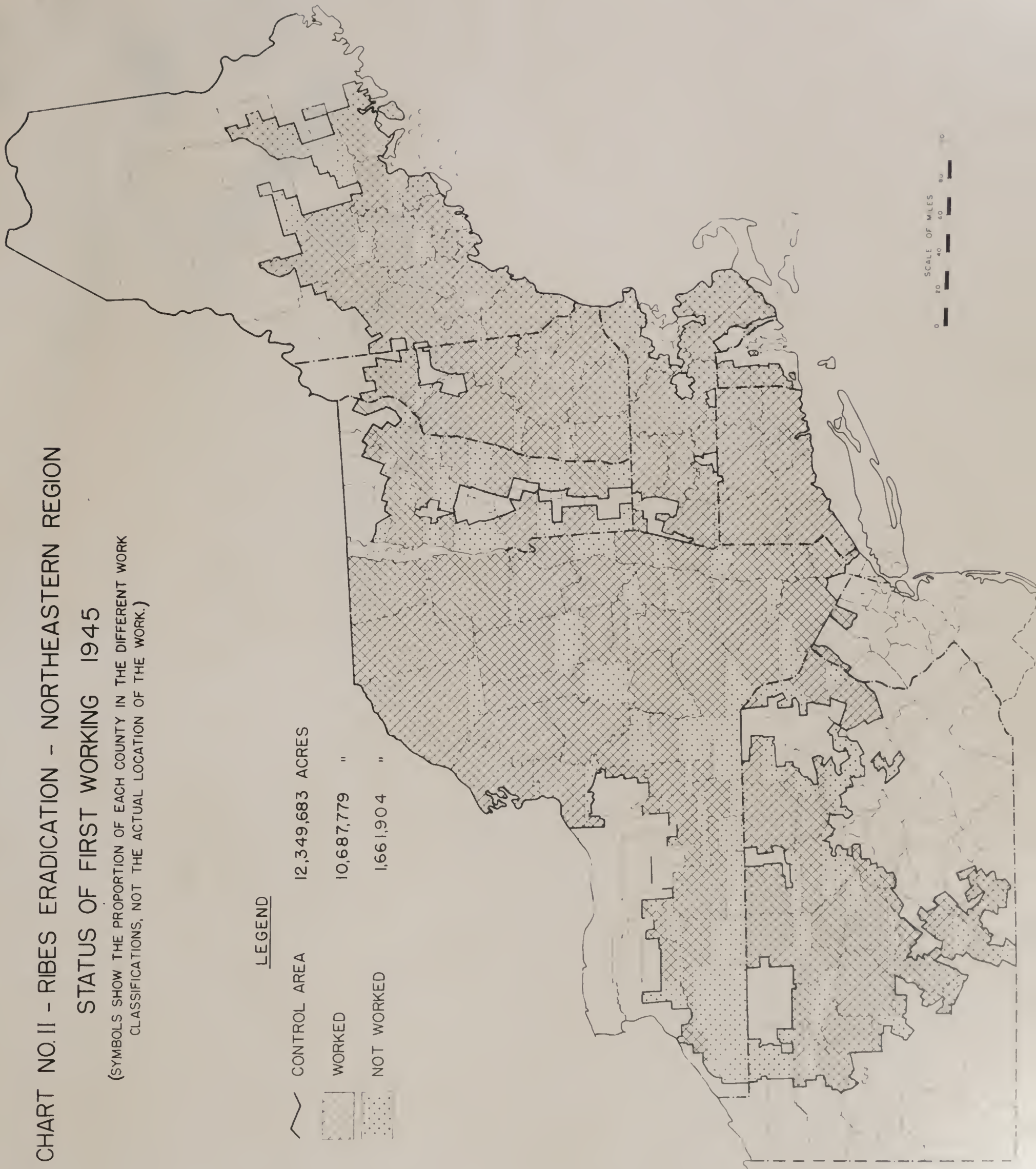


CHART NO. III - RIBES ERADICATION - NORTHEASTERN REGION

STATUS OF SECOND WORKING 1945

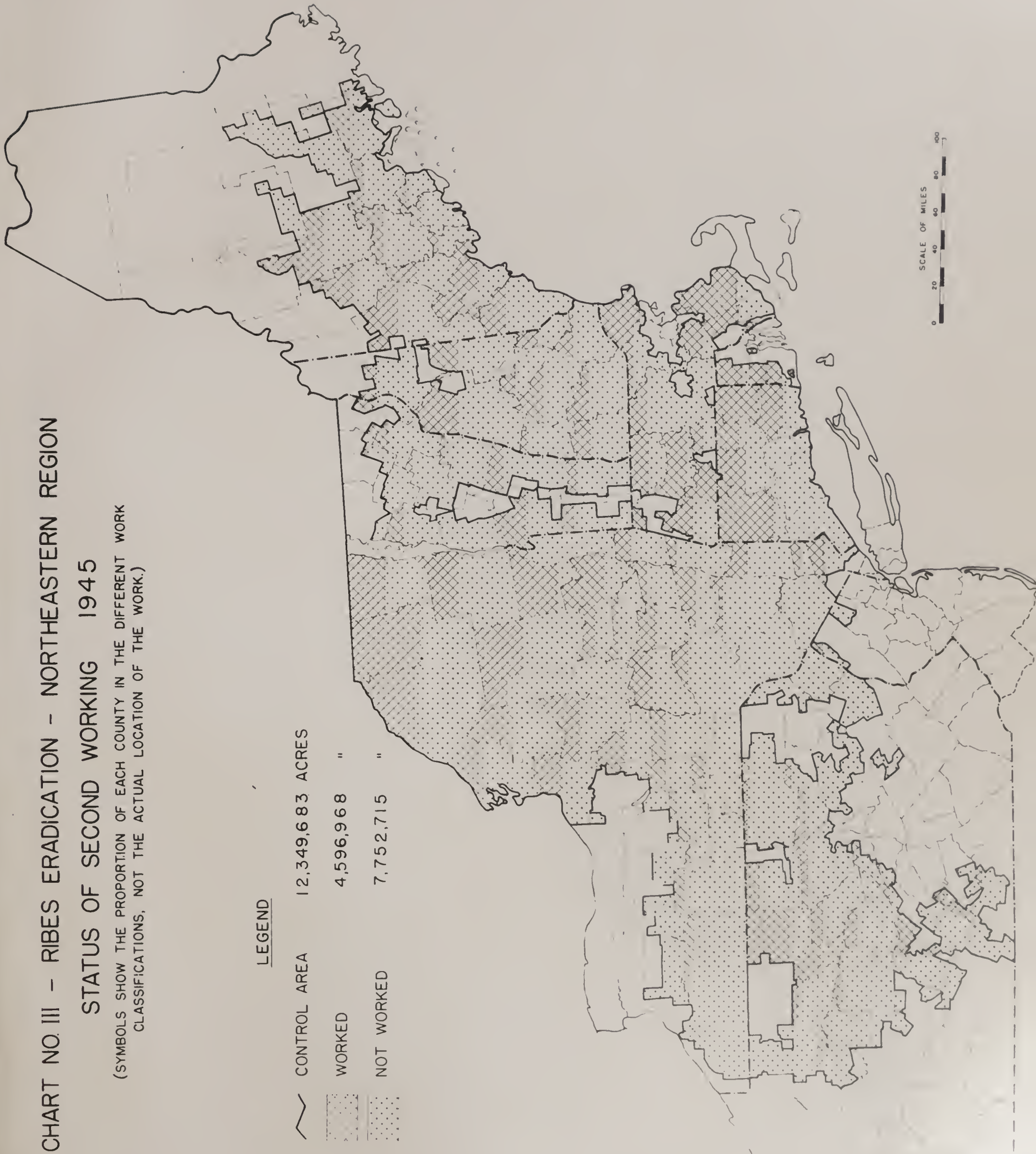
(SYMBOLS SHOW THE PROPORTION OF EACH COUNTY IN THE DIFFERENT WORK CLASSIFICATIONS, NOT THE ACTUAL LOCATION OF THE WORK.)

LEGEND

CONTROL AREA 12,349,683 ACRES

WORKED 4,596,968 "

NOT WORKED 7,752,715 "



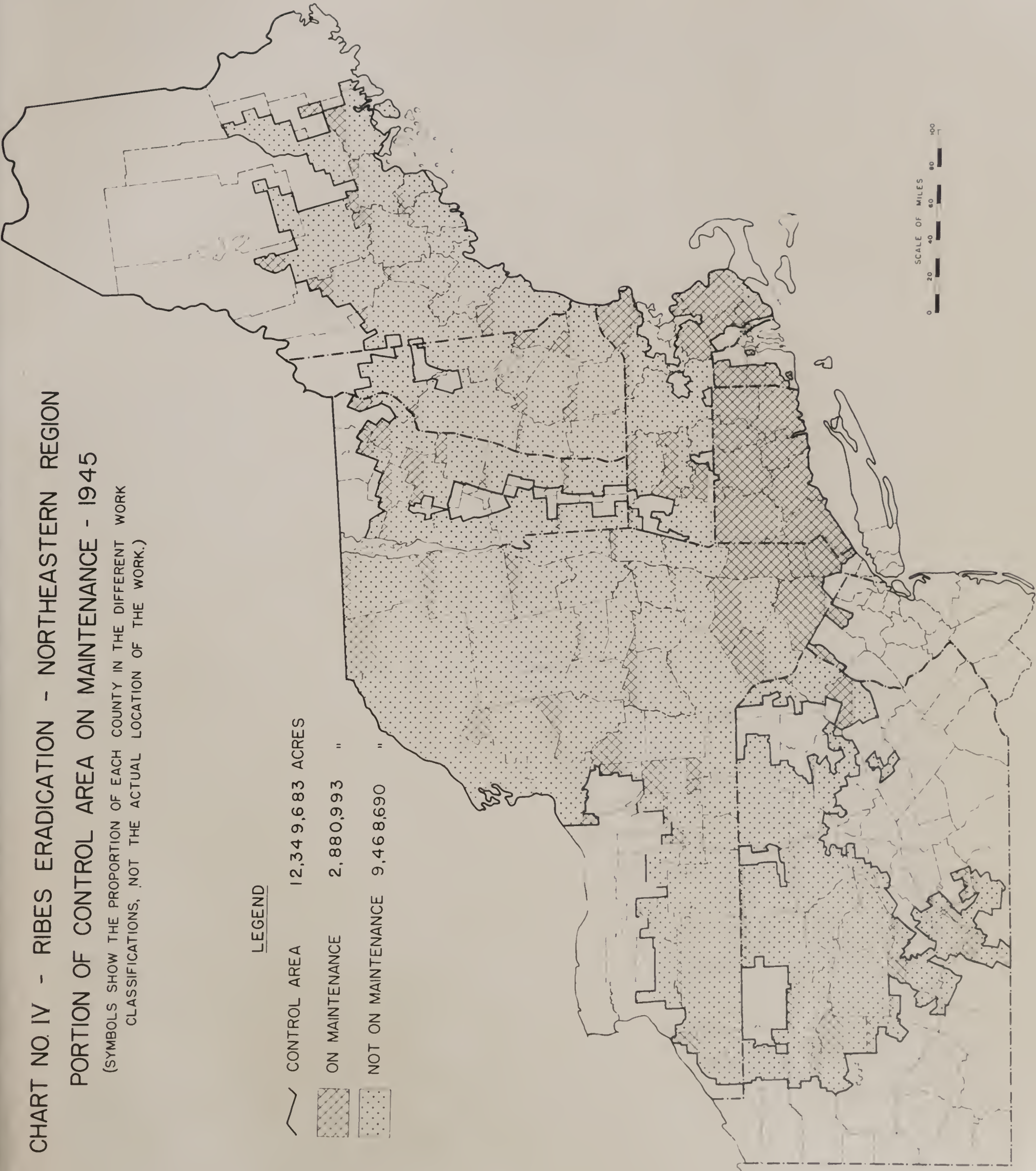
SCALE OF MILES
0 20 40 60 80 100

CHART NO. IV - RIBES ERADICATION - NORTHEASTERN REGION PORTION OF CONTROL AREA ON MAINTENANCE - 1945

(SYMBOLS SHOW THE PROPORTION OF EACH COUNTY IN THE DIFFERENT WORK CLASSIFICATIONS, NOT THE ACTUAL LOCATION OF THE WORK.)

LEGEND

~	CONTROL AREA	12,349,683 ACRES
▨	ON MAINTENANCE	2,880,993 "
▩	NOT ON MAINTENANCE	9,468,690 "



PART II

LEADERSHIP, COORDINATION AND TECHNICAL DIRECTION OF WHITE PINE BLISTER

RUST CONTROL IN NORTHEASTERN REGION - WORK PROJECT BLR-1-1

GENERAL STATEMENT

Under Work Project BLR-1-1, the Bureau of Entomology and Plant Quarantine is responsible for the leadership, coordination and technical direction of all blister rust control activities in the Northeastern Region, which comprises New York, New Jersey, Pennsylvania, and the six New England States. However, no control work has been performed in New Jersey since 1937, as all important white pine areas in that state have been given protection and are now on a maintenance basis.

Other federal agencies participating in the control program in this region are the Forest Service and the National Park Service. These agencies are allotted funds for control work under the Agricultural Appropriation Act, and are responsible for the disbursement of such funds, employment of personnel, and selection of control areas. In this work the Bureau of Entomology and Plant Quarantine is responsible for the preparation of plans, training of field personnel, checking the control work to assure effective results, keeping adequate maps and records, and making reports of the results of control activities. Projects on federal lands in this region during 1945 were restricted to Acadia National Park in Maine and the Allegheny National Forest in Pennsylvania. Detailed information on the results of such activities are given in Parts IV and V of this report.

Cooperative control work on state and privately-owned lands in each of the Northeastern States is conducted under a memorandum of understanding between the Bureau of Entomology and Plant Quarantine and the authorized state regulatory agency - usually the state forestry department. Under each of these agreements the Bureau furnishes the services of a state blister rust control leader and such district leaders as may be agreed upon from time to time in accordance with the needs of the work and the availability of funds. These leaders give direct supervision to all control activities in their respective districts. The cooperating states furnish the services of a responsible state employee (usually state forester) who has nominal charge of the cooperative program and is responsible for all matters concerned with carrying out any state laws and policies with respect to blister rust control. The states also cooperate with counties, towns, associations and individuals in the local eradication of ribes; furnish the necessary office space and facilities at state headquarters for the direction of the cooperative work; and enforce state laws for the effective prosecution of blister rust control work, including regulation of the intrastate movement of blister rust host plants.

Under the cooperative agreement in New Hampshire, the five district blister rust control leaders also act as district forest fire wardens and spend about one-fourth of their total time on such activities, the cost of which is paid from forest fire control funds. A similar arrangement prevails in Vermont, where the three district leaders spend one-quarter of their total time on informational and service work in connection with fire protection and other general forestry activities.

The blister rust control responsibilities of the Bureau of Entomology and Plant Quarantine in the Northeastern States are administered by the regional office of the Division of Plant Disease Control located at Cambridge, Mass. This office provides the over-all planning, and coordinates into a uniform program the different phases of control work performed in cooperation with state and federal agencies; budgets federal funds for field work; inspects field activities to make sure effective results are accomplished; conducts special field surveys; furnishes the blister rust control leaders and cooperative employees with subject matter and technical information essential to the proper conduct of their work; summarizes and analyzes records of accomplishments; makes purchases of supplies, materials and equipment; processes all payrolls and accounts paid from federal funds; and prepares special records, periodical and annual reports.

The Division of Domestic Plant Quarantine of the Bureau of Entomology and Plant Quarantine is responsible for the enforcement of federal regulations on the interstate movement of blister rust host plants.

Personnel

At the end of 1945, the permanent personnel of the Division of Plant Disease Control in the Northeastern States consisted of seven regional office employees, seven state leaders, and 22 district leaders. In addition, one leader was employed full time in Rhode Island, the state and Federal Government paying his salary alternately for six-month periods. In Connecticut, one full-time district leader was also employed on state funds. Dr. Rusden, who is in charge of all blister rust control investigational work in the three eastern regions, is also headquartered at the Cambridge, Mass. regional office.

District Leader Clave, of Massachusetts, was transferred to New York, effective August 16, 1945, to assist in supervising blister rust control activities in that state under the direction of Mr. William Foss, Collaborator, in charge of the Bureau of Pest Control of the New York State Conservation Department.

Due to the transfer of Mr. Clave, it was necessary to reorganize the control districts in Massachusetts. On the basis of the changes, it was not necessary to employ a new district leader to replace Mr. Clave. District Leader Wheeler has been assigned to Worcester County, and his former district has been added to Mr. Doore's. The latter's headquarters were changed to Greenfield, Mass., effective September 1, 1945, where office space and other facilities have been made available for him by the Division of Gypsy and Brown Tail Moths Control.

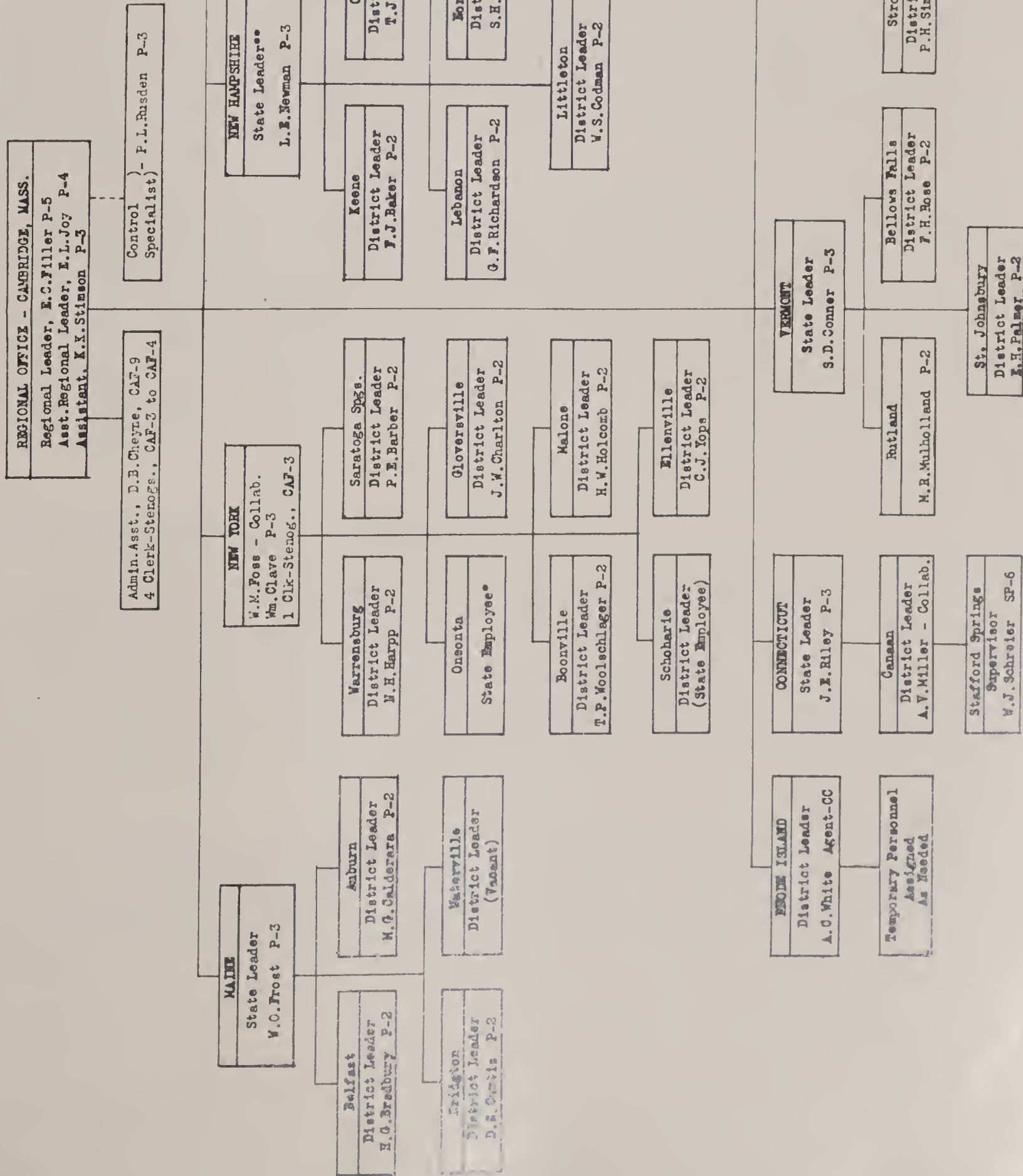
Mr. Chester J. Yops was transferred to our Division from the U. S. Forest Service, effective December 1, 1945, to fill one of the vacant district leader's positions in New York. He is headquartered at Ellenville, N. Y., and his district comprises eight counties in the southeastern part of the state where very little control work has been performed since 1943. State employees

are still supervising control activities in the Oneonta and Schoharie districts.

No permanent employees of the Division in this region entered the armed services during the calendar year 1945.

Two other personnel changes also occurred in this region during the early part of 1946. On March 6, Mr. Edward L. Joy joined our staff as assistant regional leader, with headquarters at Cambridge, Mass. Mr. Joy has been employed on blister rust control work in the Northwestern Region since 1927, and for several years prior to 1942, when he entered the armed services, was assistant regional leader, gaining broad experience in administrative, supervisory and investigational activities. Effective February 11, 1946, Mr. William J. Schreier was employed by our Division as an Agent (SP-6) to determine white pine and ribes conditions in the areas affected by the hurricane in the northeastern section of Connecticut, and to perform any necessary control work assisted by a few scouts and possibly one crew. Mr. Schreier is headquartered at Stafford Springs. No district leader has been employed in this section of the state for many years.

The following organization chart gives detail information on the permanent personnel currently employed on blister rust control activities in the Northeastern Region.



*State District Forester Hick gives general supervision to control activities in this district.
**State Leader Newman of New Hampshire also supervises control activities in the Rockingham district.
***State District Forester Hick gives general supervision to control activities in this district.
****State District Forester Hick gives general supervision to control activities in this district.

Cooperation on Other Forestry and Pest Control Projects

The blister rust control leaders, especially in New York and Pennsylvania, continued to give valuable assistance to the Timber Production War Project until this activity was terminated in the fall of 1945. At the request of the U. S. Forest Service and the New York State Conservation Department, arrangements were made to detail one of the New York leaders to this project during the period December 1, 1944 to March 31, 1945. This same leader was also detailed to full-time farm forestry work with the U. S. Forest Service for the period December 1, 1945 to March 15, 1946.

In New Hampshire the district blister rust control leaders are Secretaries of their respective County Forestry Advisory Committees. One of the Massachusetts district leaders was recently elected to serve as Secretary-Treasurer of the Essex County Forestry Committee. Close contact is also maintained with state forestry department officials, extension foresters, Norris-Doxey foresters, and other forestry agencies.

Excellent cooperation was received from the Division of Gypsy and Brown Tail Moths Control. It furnished winter storage for many of our automobiles at their Greenfield, Mass. and Wilkes-Barre, Penna. garages, and also made major repairs to several of our machines. In addition, Mr. Sheels assisted our Division by loaning us two trucks for use in transporting laborers employed on ribes eradication work in New Hampshire and Vermont, provided 500 multilith copies of our revised blister rust control manual during the spring of 1945, and office and garage space for District Leader Doore at Greenfield, starting September 1, 1945.

Collections of Stem Rust on Barberry and Grain

The blister rust control leaders in this region were again requested to make collections of stem rust on barberry leaves and on grains and grasses during the spring of 1945 for Dr. E. C. Stakman at the Federal Rust Laboratory, University Farm, St. Paul, Minnesota. This material was for use in connection with a study of the distribution and prevalence of the different physiologic races of the stem rust. Complete information is not available at the regional office on the number of stem rust collections our leaders sent to Dr. Stakman during 1945.

During October and November of 1945, twenty specimens of Berberis and Mahonia roots were collected at the Arnold Arboretum of Harvard University by Dr. Rusden, with permission of the Director, Prof. E. D. Merrill. This material was shipped to the Barberry Eradication Office at Minneapolis, Minnesota, for use in stem rust inoculation experiments conducted by Dr. R. U. Cotter.

Informational and Service Activities of District Leaders

The substantial amounts of local funds, which have been made available for cooperative control work in this region, were primarily the result of effective informational and service work by the blister rust control leaders. Such activities are especially important in the States of Maine, New Hampshire, Vermont, Connecticut and New York where town and county appropriations constitute a relatively large proportion of the total cooperative funds provided for control work. However, some informational and service work is essential in all states in order to stimulate interest and keep the public informed regarding the disease and the status of control activities.

As control work approaches a maintenance basis in this region, there may be a tendency to assume that everyone knows about the project, and that little informational and service work is now necessary. This would be a dangerous condition as it is of the utmost importance that federal, state, county and local officials, and the public be kept adequately informed regarding our work, particularly as regards the necessity for reworkings and the need for maintaining control.

Experience has demonstrated that the cheapest and most effective form of education is through the medium of news items, especially in local papers. Proper timing of such news items is essential to secure effective results.

The 16 mm. colored sound film on blister rust and its control has been used extensively throughout the region and has been very effective. Its use at numerous schools has been particularly important, as the pupils carry home to their parents the information they have received and the parents have confidence in it because it came through the schools. We have used this film to such an extent in this region that there is a real need for a new film with a different method of approach and different scenes. A scenario for a new general film for use throughout the country has already been prepared by State Leader Perry, of Massachusetts, and supplemental scenarios for regional films are now in the process of being developed. Recently the 35 mm. black and white film on blister rust was effectively used in Maine, where the local motion picture houses were very glad to show the film and it was well received by the public. One local woods operator was so impressed with the film that he sent his lumberjacks to see it. Additional copies of this film could be used to advantage and it also seems advisable to have a 35 mm. film made from the new 16 mm. film.

Blister rust talks at meetings have been used extensively and are most effective when supplemented with slides or blister rust and other forestry films. Usually it is best to have blister rust talks given at established meetings where blister rust is not the only topic. Such a procedure avoids having to make personal arrangements for the meeting and usually assures a larger attendance. A few radio talks have been given by the blister rust control leaders, but greater use should be made of available facilities.

Other methods of education include distribution of illustrative material and publications, roadside demonstrations, and displays at fairs and in store windows. Miscellaneous Publication No. 22 has been used so extensively in this region that its future value has been greatly reduced. The small blister rust leaflets have also proved useful, but here again something new is needed. Several suggestions regarding the use of more modern pamphlets were presented at the regional leaders' conference in Washington during March, 1946. Store window and post office displays were used more extensively during 1945, are easier to prepare than fair exhibits, and usually accomplish worthwhile results. For these reasons and the cancellation of many fairs during the war, the number of displays at fairs in this region has decreased considerably during recent years.

Informational work creates attention, interest and desire, but personal interviews with pine owners, local officials and other interested persons, as well as field demonstrations of the disease and control methods, are essential to obtain local cooperation.

Table 1 summarizes the 1945 informational and service activities by states. It will be noted that the volume of such work varies considerably and is somewhat greater in the states where town and county cooperation is solicited. Over 73% of all the meetings addressed by the district leaders were in New Hampshire and New York. Many of the meetings in the former state were sponsored by the County Forestry Advisory Committees or Forest Fire Wardens' Associations. The district leaders in Maine addressed only four meetings and published only four news items during 1945. However, the volume of service work performed by the Maine leaders was considerably above the average for all states, and such activities were apparently effective in obtaining more town cooperation than in New Hampshire and Vermont, where greater emphasis was given to informational activities.

On the basis of regional totals, there were decreases in all phases of the informational and service work during 1945 as compared with the previous year. The following tabulation gives a comparison of the two years' accomplishments:

	<u>1944</u>	<u>1945</u>	<u>% Decrease in 1945</u>
Meetings addressed	323	254	21.4
Attendance at meetings	27,195	17,264	36.5
News items published	215	147	31.6
Demonstrations placed	133	84	36.8
Initial interviews	5,469	5,098	6.8
Follow-up calls	5,205	4,887	6.1
Persons instructed in field	2,782	2,161	22.3

In spite of these decreases in the informational and service work a total of \$50,674.97 local cooperation was obtained during 1945 as compared with \$40,035.23 in 1944, or an increase of 26.6%.

Table 1 - Summary of 1945 Informational and Service Activities of District Blister Rust Control Leaders in Northeastern Region

Informational Activities

State	Meetings Addressed		No. Items Published	No. Demonstrations Placed
	No.	Attendance		
Maine	4	275	4	19
N.H.	111	5,979	60	15
Vt.	34	2,045	20	26
Mass.	12	1,926	6	5
R. I.	10	450	-	-
Conn.	8	131	1	3
N. Y.	75	6,458	51	12
Penna.	-	-	5	4
All States	254	17,264	147	84
Average 1945	10.2	690.6	5.9	3.4
Per Leader 1944	12.4	1,046.0	8.3	5.1

Service Activities

State	No. Initial Interviews	No. Follow-up Calls	No. Individuals Instructed in Field
Maine	848	792	185
N. H.	1,094	1,296	610
Vt.	342	800	57
Mass.	1,163	171	54
R. I.	56	32	4
Conn.	136	118	32
N. Y.	1,355	1,646	1,011
Penna.	104	32	208
All States	5,098	4,887	2,161
Average 1945	203.9	195.5	86.4
Per Leader 1944	210.3	200.2	107.0

J.I.T. and J.M.T. Courses

District Leader Clave successfully completed the 40-hour J.I.T. and J.M.T. courses given by the U.S. Civil Service Commission at Boston, Mass. during the last week in March and the first week in June. For the benefit of state and district leaders and the regional office personnel, Mr. Clave conducted 10-hour J.I.T. courses at Worcester, Mass., Concord, N.H., Auburn, Maine, and Warrensburg, N.Y. The success of these courses is indicated by the following excerpts from reports received from State Leaders Perry and Newman, respectively:

"Mr. Clave presented the J.I.T. instruction in a particularly effective manner and those in attendance collaborated so completely, the conference was an outstanding success. I believe it demonstrated the wisdom of having short sessions and a limited number of participants at conferences in general."

"Too much cannot be said of the excellent manner in which Mr. Clave conducted this short course. It was the unanimous opinion of all present that the instructor knew his subject exceedingly well and also how to put it across."

A memorandum was sent to the state leaders by the regional office in May listing suggestions for putting the principles of J.I.T. into practice in connection with our control activities. The state leaders were urged to assist their district leaders in preparing job break-downs and applying the training procedures to their control work. Many of the leaders prepared such job break-down sheets, but this material will have to be further analyzed before standard procedures are established for the various types of jobs on control work in this region. During the spring of 1946, Mr. Clave prepared "job break-down sheets" for the following practices: teaching identification of ribes, searching for ribes, eradicating ribes, working in crew formation, marking and following line, and safety. These statements were prepared for use in New York, but sufficient copies have been furnished all the district leaders in the region so that they can provide a complete set to each foreman and scout.

It was not possible to arrange for Mr. Clave to conduct 10-hour J.M.T. courses for the blister rust control leaders during 1945, but such action will be taken some time during the coming year.

Ribes Eradication Work By District Leaders

Due to the limited number of men available for ribes eradication work in 1945, several of the district leaders were able to do considerable scouting work to locate and remove ribes from definite blocks in townships suitable for this type of work.

As indicated in Table 2, the district leaders in six states spent 105 man days scouting 13,605 acres on which only 3,999 wild and 7 cultivated bushes were located and destroyed. This acreage scouted by the district leaders

represents 2.7% of the total area cleared of ribes in the region during 1945. The results of the district leaders' scouting work are included in Table 9 in Part III of this report, which summarizes the results of all control work on state and privately-owned lands, as well as in Table 31 of the Appendix.

Table 2 - Ribes Eradication Work Performed By Blister Rust Control Leaders During 1945

State	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Ribes Per Acre	Acres Per Man Day
			Wild & Cult.	Cult. Only			
N. H.	First	131	46	-	1 $\frac{1}{2}$	0.4	87.3
	Second	37	24	-	$\frac{1}{2}$	0.6	74.0
	Total	168	70	-	2	0.4	84.0
Vt.	First	749	672	-	4 $\frac{1}{2}$	0.9	166.4
	Second	938	58	-	1 $\frac{1}{2}$	0.06	625.3
	Total	1,687	730	-	6	0.4	281.2
Mass.	First	264	12	-	1	0.05	264.0
	Second	4,629	944	-	27	0.2	171.4
	Total	4,893	956	-	28	0.2	174.5
R. I.	Second	684	112	-	8	0.2	85.5
	Other	292	71	-	6	0.2	48.7
	Total	976	183	-	14	0.2	69.7
Conn.	All Second	2,005	665	-	27	0.3	74.3
N. Y.	First	975	631	2	10	0.6	97.5
	Second	400	515	5	5	1.3	80.0
	Total	1,375	1,146	7	15	0.8	91.7
Penna.	First	927	211	-	8	0.2	115.9
	Second	1,574	38	-	5	0.02	314.8
	Total	2,501	249	-	13	0.1	192.4
All States	First	3,046	1,572	2	25	0.5	121.8
	Second	10,267	2,356	5	74	0.2	138.7
	Other	292	71	-	6	0.2	48.7
	Total	13,605	3,999	7	105	0.3	129.6

Control Area Mapping By District Leaders

Three district leaders in Vermont, Massachusetts, and Rhode Island spent 89 man days on control area mapping work during 1945. These leaders mapped a total of 20,054 acres and eliminated an additional 17,508 acres where the pine did not meet minimum stocking requirements. The results of the district leaders' mapping work are also included in the accomplishments reported for state and private lands on Page 29 and in Table 27 of the Appendix.

Several of the other district leaders did some mapping work in conjunction with temporary state and federal employees assigned to such activities, but the results of the district leaders' work in such instances were not recorded separately.

Other Special Field Work By District Leaders

As in 1944, the district leaders spent considerable time during 1945 on special field activities which included the following:

1. Placing definite units of control areas on maintenance as a result of current field inspections.

2. Examination of control areas where no work has been performed for eight or more years to determine the need for rework based on existing conditions as regards pine, ribes and infection.

3. Inspection of portions of control areas affected by the hurricane of 1938 and/or logging operations prior to 1942 to determine amount of existing or potential white pine. Areas with inadequate pine stocking were discontinued from the control area and permanent maps and records revised accordingly. (The district leaders are also designating on maps the location of as many cut-over areas as possible. This is a tremendous task - in New Hampshire alone it is estimated that over 257,000 acres of white pine comprising over 10,000 lots have been cut off during the period 1940-1945, inclusive.)

As a result of this inspection work, it was possible to discontinue many areas where the existing white pine does not meet minimum stocking requirements and also reduce the width of the protection zones around other areas retained in the control area. Eleven of the district leaders in five states spent 249 man days examining 160,552 acres. Of this total, 82,797 acres were discontinued from the control area, 62,949 acres were in need of ribes eradication work, and 14,806 acres were placed on maintenance. The district leaders in New Hampshire and several leaders in the other states also performed similar inspection work in conjunction with temporary state and federal laborers assigned to such activities during the fall and winter months, but the results of the district leaders' work were not kept separate. The net control area in the region was reduced by over a quarter of a million acres during 1945, and the acreage on a maintenance basis also was increased by approximately 262,000 acres.

War Bond Purchases By Permanent Federal Personnel

Thirty-seven, or 97.4%, of the 38 federal appointees employed on blister rust control in this region during the calendar year 1945 participated in the payroll deduction plan for purchasing war bonds. Total deductions for bond purchases during the year amounted to \$12,570.96, which represents 10.14% of the gross payroll.

During the Seventh and Eighth War Loan Drives, the blister rust control personnel reported additional cash bond purchases totalling \$2,162.50. In the Seventh War Loan Drive, only 84.1% of the quota was attained, but purchases during the Eighth War Loan Drive amounted to 103.1% of the quota established for our employees.

Total purchases of war bonds, both under the payroll deduction plan and during the two special drives during 1945 amounted to \$14,733.46 (purchase price of bonds) which represents 11.88% of the gross payroll for the 38 federal employees in the region, or an average of \$387.72 per person. This does not include any cash purchases which may have been made outside the periods covered by the special war loan drives as such purchases were not reported to the regional office.

As of March 31, 1946, thirty-three of the 39 permanent employees in this region are still participating in the payroll deduction plan and allotting 8.83% of their gross salaries for bond purchases.

Table 3 - Expenditures and Contributed Services For Work Project BLR-1-1
During Calendar Year 1945

State	Value of Contributed Services By States*	B.E.&P.Q. Expenditures (3101.14)	Grand Total
Maine	300.00	19,113.37	19,413.37
N.H.	300.00	21,811.79	22,111.79
Vt.	630.00	14,455.76	15,085.76
Mass.	183.37	19,073.00	19,256.37
R.I.	500.16	649.98	1,150.14
Conn.	999.96**	4,974.17	5,974.13
N.Y.	5,000.04	25,569.59	30,569.63
Penna.	130.00	12,519.88	12,649.88
All States	8,043.53	118,167.54	126,211.07

*Technical services of other state employees

**Includes \$200.00 chargeable to Project BLR-2

Table 4 - Classification of Federal 3101.14 Expenditures For Work Project BLR-1-1
During Calendar Year 1945

State	Salaries of Appointees			L/A Expenditures	Leases	Total
	Base Pay	Overtime	Total			
Maine	13,717.10	1,658.62	15,375.72	3,475.65	262.00	19,113.37
N.H.	18,520.95	2,347.25	20,868.20	523.59	420.00	21,811.79
Vt.	11,040.56	1,542.99	12,583.55	1,872.21	-	14,455.76
Mass.	15,095.22	1,911.91	17,007.13	1,975.87	90.00	19,073.00
R.I.	649.98	-	649.98	-	-	649.98
Conn.	3,789.92	384.22	4,174.14	800.03	-	4,974.17
N.Y.	17,223.98	1,861.51	19,085.49	6,181.10	303.00	25,569.59
Penna.	10,020.79	1,180.36	11,201.15	1,174.73	144.00	12,519.88
All States	90,058.50	10,886.86	100,945.36	16,003.18	1,219.00	118,167.54

Tables 3 and 4 do not include Federal 3101 expenditures for the Cambridge regional office totalling \$29,720.79 which consisted of \$26,603.24 for the salaries of appointees, \$2,767.55 L/A expenses, and \$350.00 for leases. Dr. Rusden's salary and expenses for the entire year are included in the Cambridge Office expenditures.

PART III

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATELY-OWNED LANDS
IN NORTHEASTERN REGION - WORK PROJECT BLR-3-1

GENERAL STATEMENT

Over 99% of the white pine forests in the Northeastern Region are in state or private ownership, chiefly farm wood lots. Blister rust control work on such lands in this region is being conducted under cooperative agreements between the U.S. Bureau of Entomology and the New England States, New York and Pennsylvania. Operations in New Jersey were suspended after 1937 since the control area in that state, comprising only 16,742 acres, is on a maintenance basis. Under the provisions of the Lea Act, federal funds have been allotted to the various states since July 1, 1941 for control work on state and privately-owned lands with the provision that such allotments be matched on at least a dollar for dollar basis by state and local cooperative funds or direct services.

The present net control area on state and privately-owned lands in this region comprises 12,325,259 acres of which 4,184,308 acres are in white pine growth meeting minimum stocking requirements. As a result of the ribes eradication work performed during the period 1918-1945, inclusive, initial control has been established on 10,663,961 acres, or 86.5% of the present net control area. Approximately 37.2% of the control area has been worked twice, and 5.2% has been worked three times. Several hundred thousand additional acres have been worked, but later discontinued from the control area due to reductions in the width of protection zones or discontinuance of units where the white pine no longer met minimum stocking requirements due to logging, fire, hurricane damage, etc.

State and Local Cooperation on Project BLR-3-1

In spite of war-time conditions, the states and their local cooperators have continued to give active support to the control program since 1941. In Maine, New Hampshire, Massachusetts, Connecticut and New York, state funds are appropriated specifically for blister rust control, while in Vermont, Rhode Island and Pennsylvania allotments for control activities are obtained from other state appropriations, usually for general forestry work. Funds, from other state appropriations have also been made available in New Hampshire and Massachusetts. Total cash expenditures from all state funds for Project BLR-3-1 during the calendar year 1945 amounted to \$51,501.09 as compared with \$46,900.03 the previous year, or an increase of 9.8%. The states also contributed services valued at \$12,008.72 for this project during 1945.

County cooperation was restricted to New York where 8 counties appropriated \$11,556.21 for control work in 1945, of which \$11,055.89 was expended. In addition, one New York county contributed services valued at \$1,106.25, making a total of \$12,162.14 county cooperation on Project BLR-3-1, which was an increase of 5.4% over the preceding year.

Town cooperation was solicited during 1945 in Maine, New Hampshire, Vermont, Connecticut, and in one New York district. A total of 157 towns in these five states appropriated \$37,651.66, which included \$2,335.32 carried over from the previous year's unexpended appropriation in 13 towns and \$2,758.34 expended in 9 New Hampshire towns where the compulsory state law was applied. In addition, one Massachusetts city contributed \$106.60 for ribes eradication work on its watershed property. The total amount of town funds available from all sources during 1945 was \$37,758.26 as compared with \$26,862.02 in 1944, or an increase of 40.6%. The most noteworthy increase in 1945 was in New Hampshire where 49 towns made new appropriations totalling \$13,775.00 in marked contrast to 1944 when only 20 towns raised \$4,915.00.

Although a total of \$37,758.26 town money was available in 1945, actual expenditures amounted to only \$25,039.62. Due to the acute labor shortages in some localities, it was not possible to spend the town money. In 25 towns in Maine and New Hampshire, unexpended 1945 appropriations totalling \$5,611.00 will be available for use in 1946. At their 1946 annual meetings during the spring, 132 towns in Maine, New Hampshire and Vermont appropriated a total of \$31,650.00 for blister rust control. It is also planned to apply the compulsory law in 8 other New Hampshire towns involving an expenditure of \$3,116.00. Table 6 gives a summary of all town cooperation during 1945 and 1946 in the Northeastern Region.

Sixteen towns in Connecticut added \$3,083.00 to their sinking funds during 1945 for blister rust control work. During the period 1940-1945, inclusive, 20 towns in Connecticut have raised \$14,205.30 under this plan or by special appropriations. Of this total, only \$2,272.40 has been expended and \$3,552.30 was reverted to the town treasuries, leaving a balance of \$8,380.60 available for future control work as needed.

During the past several years, very little individual cooperation has been solicited on control activities in this region. In 1945, only \$360.85 was expended by 22 cooperators, and all of this money was spent for ribes eradication except \$4.50 expended on blister rust canker elimination work by one pine owner in Maine.

Table 25 on Page 56 of the Appendix lists detail information on local cooperative expenditures, by states, during the calendar year 1945.

As indicated in the following table, state and local cooperative expenditures and contributed services for Project BLR-3-1 continued to increase each year during the war.

Table 5 - State and Local Cooperative Expenditures and Contributed Services
For Project BLR-3-1 During Period 1942-1945, Inclusive

Calendar Year	States	Counties	Towns	Individuals	Total
1942	47,628.17	9,534.75	15,601.04	2,193.91	74,957.87
1943	50,315.35	7,552.88	17,400.82	906.56	76,175.61
1944	56,307.48	11,536.91	17,686.72	833.98	86,365.09
1945	63,509.81	12,162.14	25,039.62	360.85	101,072.42
Total	217,760.81	40,786.68	75,728.20	4,295.30	338,570.99

Table 6 - Town Cooperation During 1945 and 1946 in Northeastern States

State	Maine		New Hampshire		Vermont		Total	
	1945	1946	1945	1946	1945	1946	1945	1946
Town Appropriations: Number Amount	38 \$7,100.00	42 \$7,550.00	49 \$13,775.00	60 \$17,600.00	27 \$5,900.00	30 \$6,500.00	114 \$26,775.00	132 \$31,650.00
Towns Carrying Over Funds From Previous Year: Number Amount	12 2,035.32	9 1,400.00	16 300.00	16 4,211.00	0 0	0 0	13 2,335.32	25 5,611.00
Compulsory Town Appropriations: Number Amount	0 0	0 0	9 2,758.34	8 3,116.00	0 0	0 0	9 2,758.34	8 3,116.00
Total Town Approp- riations: Number Amount	50 \$9,135.32	51 \$8,950.00	59 \$16,833.34	84 \$24,927.00	27 \$5,900.00	30 \$6,500.00	136 \$31,868.66	165 \$40,377.00

In addition, 16 Connecticut towns added \$3,083 during 1945 to their sinking funds for blister rust control work during 1946 and in the future as needed. In 1944, 17 Connecticut towns added \$3,563 to their sinking funds for control work.

In New York, 6 towns raised \$2,700. for control work during 1945, but no town funds were solicited in that state in 1946.

*Also made new appropriation of \$100.00 in 1945.

Control Area Mapping During 1945

A few temporary workers were employed on control area mapping before and after the 1945 ribes eradication season in New Hampshire, Vermont, Massachusetts, Connecticut, New York and Pennsylvania. Several of the district leaders also did considerable mapping work, some of which was performed in conjunction with the temporary employees' activities and the results were not recorded separately. A total of 179,945 acres was mapped in detail and an additional 69,073 acres of non-pine land definitely eliminated from control work as a result of 1,745 man days labor by all employees. Tables 27 to 30 in the Appendix summarize the results of the 1945 mapping work by states, accomplishments for the period 1933 to 1945 by states and work programs, and the present status of the mapping project in each state.

Control Area Examination Work During 1945

In addition to the detail mapping work described in the preceding paragraph, many of the district leaders and several temporary employees in all states, except Maine and Connecticut, spent 1,402 man days in 1945 examining control areas to determine: (1) units which could be placed on maintenance, (2) areas needing rework, and (3) tracts with inadequate pine stocking which could be discontinued from the control area. In many instances it was also possible to reduce the width of the protection zones around the units retained in the control area. This special work resulted in 525,948 acres being examined, of which 205,313 acres were discontinued from the control area. A total of 22,062 acres were placed on maintenance, and 298,553 acres were found to be in need of ribes eradication. Table 7 summarizes the results of this control area examination work by states.

Table 7 - Results of Special Control Area Examination Work During 1945

State	Total Acreage Examined	Acreage Found To Be In Need of Ribes Erad.	Acreage Placed on Maintenance	Acreage Discontinued From Control Area	Total Man Days
N. H.	195,435	134,452	2,506	58,477	450
Vt.	66,746	49,661	1,449	15,636	177
Mass.	164,913	66,467	-	98,446	375
R. I.	5,540	-	954	4,586	10
N. Y.	51,521	28,106	5,285	18,130	339
Penna.	41,793	19,867	11,888	10,038	51
All States	525,948	298,553	22,062	205,313	1,402

Many areas were also discontinued or placed on maintenance in conjunction with the ribes eradication work. The net control area on state and private lands was reduced by 254,965 acres and at the end of 1945 included 12,325,259 acres. An additional 260,267 acres of control area on state and private lands were also placed on maintenance during 1945.

RIBES ERADICATION WORK ON STATE AND PRIVATE LANDS DURING 1945

Excessive and frequent rains during May and June and the first half of July caused much lost time and lush vegetation which slowed down field work due to the difficulty in finding the ribes. As the men were paid only for time actually worked, lost time because of the rainy weather caused dissatisfaction. The low wage scale of 62¢ per hour for unskilled workers and 72¢ per hour for skilled did not attract men to the project. On August 12th, these rates were increased to 65¢ and 75¢ per hour, respectively, but the small increases had little effect in improving conditions. There was also some feeling that the skilled workers (crew foremen) were underpaid in comparison with the unskilled employees. Rationing of food and shortage of dwellings made it difficult to find lodging and boarding places for crews composed of men living away from their homes. The cost to the workers for such expenses was also increased. Considerable initiative was shown by many of the district leaders, especially in Vermont, in securing men and arranging accommodations for them. When local labor could not be obtained, the Vermont leaders secured non-resident workers and arranged for their accommodations at tourist and old C.C.C. camps, or in buildings on state lands.

Restrictions on gasoline to individuals prior to August and the poor condition of private cars made it nearly impossible for workers to get to and from their jobs except in Government trucks which were inadequate in number. This problem was aided somewhat by borrowing a few trucks from the Division of Gypsy and Brown Tail Moths Control.

The greatest problem, however, was in securing laborers for the project. This condition was more or less true in all states, but was especially acute in Maine, New Hampshire, Vermont, Pennsylvania, and parts of New York. The largest number of laborers were obtained in Essex and Warren Counties in New York and in northern Grafton County district in New Hampshire where there were very few war industries. It was particularly difficult to obtain experienced foremen or even men who could be trained for such positions. Labor consisted mostly of teen-aged boys and local men unfit for military service or employment in war industries. For the most part these employees were inexperienced and required close supervision. Such workers made it difficult to adopt flexibility of methods to meet varying field conditions. There were many cases of failure to report for duty and quitting the job because the work was too strenuous or monotonous. Not much success was obtained in securing the services of discharged veterans due to the temporary nature of the work, low wages, pay only for actual time worked, and the desire of most veterans to take prolonged vacations after terminating their war services. A few veterans

living in rural sections became excellent foremen on our project, but others worked only a few days and then quit because the work was unsuited for their physical condition or other causes. As the war was still in progress when the increased federal funds became available on July 1, which is about the middle of the ribes eradication season, it was not practicable to recruit much additional labor. Also, the control season was short because the teenage boys, who made up the bulk of the field force, had to return to school early in September. During the period July to September, the total man days of employment was 40% less than the amount scheduled.

Temporary Personnel Employed on Ribes Eradication Work During 1945

A maximum of 577 laborers, scouts and foremen were employed by all cooperating agencies during 1945 on ribes eradication work conducted on state and privately-owned lands. This figure includes the peak number employed during a single semi-monthly or bi-weekly period in each state. Peak employment occurred at slightly different times in the various states.

As indicated in Table 8, a maximum of 383 laborers, scouts and foremen were employed on federal 3103 funds, with peak employment occurring during July or August in all states. The total number of temporary workers employed (regardless of length of service) on federal 3103 funds during 1945 was 622 as compared with 546 in 1944. The difference between the total number of 3103 employees (622) and the peak number employed during a single payroll period (383) does not represent the actual turnover of such employees. Many of the temporary employees were on federal payrolls for varying periods and later paid from state or local cooperative funds or vice versa.

Table 8 - Temporary Personnel Employed on Ribes Eradication During 1945
(Work on state and private lands only)

State	Maximum Number of Laborers, Scouts and Foremen Employed By All Agencies	Employees Paid From Federal 3103 Funds	
		Maximum Number	Period of Peak Employment
Maine	105	72	July 1-14
N. H.	115	66	July 29-August 11
Vt.	58	47	July 1-14
Mass.	35	22	August 26-September 8
R. I.	4	2	May 1-October 6
Conn.	24	11	July 25-August 11
N. Y.	202	138	July 29-August 25
Penna.	34	25	July 1-14
All States	577	383	-

Results of 1945 Ribes Eradication Work

Ribes eradication work was performed on 493,605 acres of state and privately-owned lands during 1945, a total of 2,133,604 wild and cultivated ribes being destroyed as a result of 31,210 man days labor. Compared with the previous year, there was an increase of 20.2% in acreage cleared of ribes and 7.7% in man days employment on such control work, but a decrease of 14.1% in number of ribes destroyed. The following tabulation gives a comparison of the acreages worked in each state during the past two years:

<u>State</u>	<u>Acreage Cleared of Ribes</u>		<u>% Increase or Decrease 1945 Over 1944</u>
	<u>1944</u>	<u>1945</u>	
Maine.....	73,521	95,251	+ 29.6
N. H.	20,239	38,412	+ 89.8
Vt.	17,897	23,067	+ 28.9
Mass.	43,384	63,376	+ 46.1
R. I.	5,665	7,561	+ 33.5
Conn.	25,270	21,947	- 13.1
N. Y.	202,402	227,371	+ 12.3
Penna.	22,310	16,620	- 25.5
All States.....	410,688	493,605	+ 20.2

There were increases in acreage worked during 1945 in all states, except Connecticut and Pennsylvania which had decreases of 13.1% and 25.5%, respectively. The largest increase was 89.8% in New Hampshire, but the acreage examined for ribes during 1944 was an all-time low for that state and was due primarily to the acute labor shortage. The increase of 46.1% in acreage worked in Massachusetts during 1945 was most noteworthy since 4.1% less man days were expended on such activities in 1945.

Table 9 - Ribes Eradication Work on State and Private Lands During 1945

Initial Control Work

State	Total Acreage Worked	% Total For Each State	Average Acreage Worked Per District in Each State	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
				Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	17,549	21.3	5,850	196,821	-	1,329	11.2	.03	13.2
N.H.	10,795	13.1	1,799	135,400	14	1,433	12.5	.13	7.5
Vt.	13,890	16.8	4,630	120,911	13	1,883	8.7	.14	7.4
Mass.	6,975	8.5	1,744	10,093	-	358	1.4	.05	19.5
N.Y.	21,834	26.5	3,119	115,305	1,366	1,384	5.3	.05	15.8
Penna.	11,379	13.8	5,690	95,319	104	1,241	8.4	.11	9.2
All States	82,422	100.0	2,944	673,849	1,497	7,628	8.2	.09	10.8

Second Workings

Maine	71,377	23.8	23,792	330,649	9	3,426	4.6	.05	20.8
N.H.	24,539	8.2	4,090	172,730	413	3,196	7.0	.13	7.7
Vt.	8,294	2.8	2,765	63,187	44	1,104	7.6	.13	7.5
Mass.	48,126	16.0	12,031	60,478	1,277	1,620	1.3	.03	29.7
R.I.	5,046	1.7	5,046	1,965	19	272	0.4	.05	18.6
Conn.	8,470	2.8	4,235	26,037	-	548	3.1	.06	15.5
N.Y.	129,203	43.0	18,458	475,708	45	6,964	3.7	.05	18.6
Penna.	5,241	1.7	2,620	36,495	8	416	7.0	.08	12.6
All States	300,296	100.0	10,725	1,167,249	1,845	17,546	3.9	.06	17.1

Other Workings

Maine	6,325	5.7	2,108	35,320	3	285	5.6	.05	22.2
N.H.	3,078	2.8	513	17,554	-	411	5.7	.13	7.5
Vt.	883	0.8	294	4,611	-	134	5.2	.15	6.6
Mass.	8,275	7.5	2,069	12,750	3	325	1.5	.04	25.5
R.I.	2,515	2.3	2,515	979	-	182	0.4	.07	13.6
Conn.	13,477	12.1	6,738	18,193	15	588	1.3	.04	22.9
N.Y.	76,334	68.8	10,905	203,099	33	4,111	2.7	.05	18.6
All States	110,887	100.0	3,960	292,506	54	6,036	2.6	.05	18.4

Table 9 (Continued) - Ribes Eradication Work on State and Private Lands During 1945All Work

State	Total Acreage Worked	% Total For Each State	Average Acreage Worked Per District In Each State	No. Ribes Destroyed		Total Man Days	Per Acre		Acre Worked Per Man Day
				Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	95,251	19.3	31,750	562,790	12	5,040	5.9	.05	18.9
N.H.	38,412	7.8	6,402	325,684	457	5,040	8.5	.13	7.6
Vt.	23,067	4.7	7,689	188,709	57	3,121	8.2	.14	7.4
Mass.	63,376	12.8	15,844	83,321	1,280	2,303	1.3	.04	27.5
R.I.	7,561	1.5	7,561	2,944	19	454	0.4	.06	16.7
Conn.	21,947	4.4	10,973	44,230	15	1,136	2.0	.05	19.3
N.Y.	227,371	46.1	32,482	794,112	1,444	12,459	3.5	.05	18.2
Penna.	16,620	3.4	8,310	131,814	112	1,657	7.9	.10	10.0
All States	493,605	100.0	17,629	2,133,604	3,396	31,210	4.3	.06	15.8

As indicated in Table 9, the acreage cleared of ribes in the Northeastern States during 1945 consisted of 82,422 acres of initial work, 300,296 acres of second work, and 110,887 acres of other workings. Of the total acreage examined, 83.3% was rework as compared with 76% in 1944. This high percentage is to be expected as all of the initial work has been completed in Rhode Island and Connecticut, while in New Hampshire and Massachusetts, the percentages are now 91.9% and 97.7% respectively. Also, the chief objective on our work for the duration of the war has been to maintain control on as many of the protected areas as possible. As in 1944, the amount of initial work performed during 1945 in Vermont and Pennsylvania did exceed the acreage of rework. In these two states, 39.8% and 26.7%, respectively, of the control area is still in need of initial protection.

The total acreage worked per district averaged 17,629 acres for all states, and ranged from 6,402 acres in New Hampshire to 32,482 acres in New York. In the Essex and Warren County, New York district a total of 114,736 acres were examined for ribes in 1945, all but 3,950 acres being rework. No satisfactory comparison can be made of the district averages for the respective states since there were several factors which influenced the volume of control work, such as amount of state and local cooperation, availability and quality of labor, abundance and distribution of ribes, and use of scout or crew methods. Also, the allotment of federal 3103 funds for ribes eradication work in each state is dependent on the amount of state and local cooperative money available for such activities.

There has been a general decrease in the number of ribes destroyed per acre on the areas worked in this region since 1940 and this decrease continued during 1945 when only 4.3 bushes per acre were removed on the 493,605 acres examined in all states. This average is an all-time low for the region. However, these low averages are misleading as portions of the areas do contain a considerable number of ribes and experience has shown that it is necessary an area be examined in its entirety in order to locate and destroy the ribes concentrations and thereby give adequate protection to the pine. Large portions of the control areas, especially on rework, can be scouted at a relatively low cost. Provision was made in 1945 to obtain separate ribes and man days data for second and subsequent workings. As indicated in Table 9, an average of 3.9 ribes per acre were destroyed on all second work and 2.6 bushes per acre on all other reworkings as compared with 8.2 ribes per acre for the initial work. With one or two minor exceptions, approximately the same proportions prevailed for the per acre ribes values in the individual states. It will also be noted that based on regional totals, the acreages worked per man day were greater for the second and subsequent workings. The high average of 27.5 acres per man day for all work in Massachusetts was primarily due to the large amount of scouting work performed in two districts where a total of 50,849 acres were examined. The three states (New Hampshire, Vermont, and Pennsylvania) with the lowest daily production averages also had the highest ribes per acre averages.

Checking of 1945 Ribes Eradication Work

There was no change in the procedure for checking the efficiency of the ribes eradication work in this region during 1945. The crews were required to make frequent checks on portions of their own work, and the results of such checks are recorded on the weekly BQ-30 reports, copies of which are furnished the district and state offices only. The district leaders' supervisory inspections include observations of the crews at work and measured general checks in completed areas. In several of the states, especially in New York, a few experienced foremen assisted on the measured general checking work in the districts where several crews were employed and the district leaders had to spend the major portion of their time securing labor, training new personnel, and directing the field activities.

Crew inspections are especially important because they keep the blister rust control leaders in close touch with any special problems that may arise and enable them to take immediate action to correct any faulty procedures. In making measured general checks, half rod or rod wide strip lines are run through the most likely ribes sites in worked areas and a record kept of the acreage examined, number and live stem footage of bushes found on the checks which were missed by the crews or scouts. If the checks show more than 20 feet of live stem per acre, which is the maximum for approved work in this region, the work is disapproved and action taken to have the crew or scout rework any necessary portions of the area in order to bring the entire job up to standard. Special forms are provided for recording the results of each measured general check and these reports are forwarded to the regional office weekly. This office has prepared semi-monthly or monthly summaries of the checking data for each state, copies of which were sent to the respective blister rust control leaders.

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Table 10 - Results of Measured General Checks of 1945 Ribes Eradication Work

State	Checks Made By	No. Checks	Hours Checking	Acres in Strip Checks	Ribes Found on Checks		Ribes Live Stem Found on Checks		Control Work	
					Total No.	Ave. Per Acre	Total FLS	FLS Per Acre	Approved	Disapproved
Maine	District Leaders	28	39	35.55	169	4.8	619	17.4	22	6
	Erad. Assistants	30	61	46.50	165	3.5	287½	6.2	30	-
	Total	58	100	82.05	334	4.1	906½	11.0	52	6
N.H.	District Leaders	154	232	121.31	690	5.7	1,345½	11.1	138	16
	Erad. Assistant	6	28	22.00	32	1.5	37	1.7	6	-
	Total	160	260	143.31	722	5.0	1,382½	9.6	144	16
Vt.	District Leaders	118	147	140.45	535	3.8	1,395½	9.9	114	4
Mass.	" "	267	291	283.50	796	2.8	1,852	6.5	265	2
R.I.	" "	23	66	20.83	87	4.2	154	7.4	20	3
Conn.	" Leader*	36	52	39.37	515	13.1	1,099½	27.9	28	8
	Erad. Assistant	7	11	9.56	56	5.9	100	10.5	7	0
	Total	43	63	48.93	571	11.7	1,199½	24.5	35	8
N.Y.	District Leaders	181	260	227.35	636	2.8	1,559½	6.9	177	4
	Erad. Assistants	620	1,622	1,429.80	2,423	1.7	9,054½	6.3	587	33
	Total	801	1,882	1,657.15	3,059	1.8	10,614	6.4	764	37
Penna.	District Leaders	72	67	53.58	462	8.6	1,101	20.5	52	20
All States	" "	879	1,154	921.94	3,890	4.2	9,126½	9.9	816	63
	Erad. Assistants	663	1,722	1,507.86	2,676	1.8	9,479	6.3	630	33
	Total	1,542	2,876	2,429.80	6,566	2.7	18,605½	7.7	1,446	96

*Includes three checks reported by State Leader Riley.

Analysis

State	No. Districts	Averages Per District				% Total Acreage Worked During 1945 Covered By Measured General Checks	% Worked Areas Checked Which Were Approved
		Acreage Cleared of Ribes*	No. Measured General Checks	Hours on Measured General Checks	Acreage of Measured General Checks		
Maine	3	31,750	19.3	24.9	27.4	0.09	89.7
N.H.	6	6,402	26.7	43.3	23.9	0.37	90.0
Vt.	3	7,689	39.3	49.1	46.8	0.61	96.6
Mass.	4	15,844	66.7	72.8	70.9	0.45	99.2
R.I.	1	7,561	23.0	66.0	20.8	0.28	87.0
Conn.	2	10,973	21.5	31.6	24.5	0.22	81.4
N.Y.	7	32,482	114.4	268.8	236.7	0.73	95.4
Penna.	2	8,310	36.0	33.5	26.8	0.32	72.2
All States	28	17,629	55.1	102.7	86.8	0.49	93.8

*All work on state and privately-owned lands.

Table 10 summarizes the results of the measured general checking by states and gives an analysis of the data on the basis of averages per district. The

district leaders and their assistants spent 2,876 man hours making 1,542 measured general checks in worked areas, and found a total of 6,566 missed ribes with 18,605 feet of live stem on the 2,429.8 acres covered by the strip checks. The eradication assistants made 43% of these 1945 checks as compared with 34% the previous year. For the region as a whole, there was a small increase in the volume of such checking work, but the acreage of the strip checks represented only 0.49% of the total acreage cleared of ribes this season. New York was the only state which approached the goal of 1.0% for such checking work. However, the checking was restricted chiefly to sections where heavy ribes concentrations were encountered, and such sites comprise only a relatively small percentage of the total acreage worked. A large portion of the areas worked by scouting methods required no checking, due to the scarcity of ribes.

An average of only 7.7 feet of live stem per acre was found on all checks during 1945 as compared with an average of only 7.6 feet the previous two years. The averages in the various states ranged from 6.4 in New York to 24.5 in Connecticut, where the relatively high average was primarily due to poor work in five skunk currant areas, where an average of 238.3 feet of live stem was found on the checks. The average of 23.5 feet of live stem per acre for the checks in Pennsylvania is high, but in the Brockville district many *Ribes rotundifolium* are encountered in some of the control areas, and exceptionally good work is necessary in such tracts to reduce the live stem to the 20 feet or less per acre required for approved work. Several of the 1945 checks in this district showed from 21 to 30 feet of live stem per acre, which was only a relatively small percentage of the original total, but still more than the maximum established for approved work in the region.

The control work was approved on 93.8% of all the areas checked in 1945, but in Connecticut and Pennsylvania the percentages were only 81.4% and 72.2% respectively, for the reasons outlined in the preceding paragraph. An analysis of the ribes live stem data for the checks where the work was disapproved shows the following:

<u>State</u>	<u>No. Checks Where Work Disapproved</u>	<u>Average Live Stem Per Acre Found on Checks in Disapproved Areas</u>	<u>Maximum Live Stem Per Acre Found on Checks in Any Disapproved Area</u>
Maine	6	91.3	571.4
N. H.	16	36.2	160.0
Vt.	4	98.9	141.6
Mass.	2	22.5	31.0
R. I.	3	31.5	42.2
Conn.	8	167.3	760.0
N. Y.	37	31.3	150.0
Penna.	20	40.1	84.0
All States	96	44.3	760.0

Action was taken to rework any portions of the control areas where the checks showed more than the maximum of 20 feet of live stem per acre allowable for approved work. In the Brockville district in Pennsylvania, a few of the disapproved areas were scheduled for rework during the spring of 1946, as the undergrowth was too dense for effective work this season.

Transportation of Workers

In most instances, it was necessary to furnish transportation for the crews employed on the 1945 ribes eradication work, but every effort was made to keep automobile travel to a minimum. To accomplish this, careful planning of field activities was essential. Our Division furnished 44 trucks for crew transportation, 13 of these machines being assigned to Maine. Two trucks were loaned to us by the Division of Gypsy and Brown Tail Moths Control for use on control projects in New Hampshire and Vermont. Several state and county-owned trucks were also available to transport crews in New York. A few laborers were authorized to use their privately-owned cars on official travel. However, most employees who owned cars were reluctant or unable to use them in getting to and from work, due to the tire and gasoline shortages as well as the poor condition of most of the machines.

At the end of 1945, there were 45 government owned half-ton pick-up or sedan delivery trucks on hand in this region. Of this total 19 are 1935 models, 14 were manufactured in 1936, and the other 12 were made in 1939. Most of these trucks have been operated from sixty to over a hundred thousand miles, and the maintenance and operating costs are now exceptionally high. Funds were allotted for the purchase of a few new trucks during the fiscal year 1946, but it now appears that it will not be possible to obtain any new machines, and it is extremely doubtful if any surplus automotive equipment can be secured through the War Assets Corporation.

Insect Repellent Tests During 1945

The blister rust control personnel in this region cooperated with the Division of Insects Affecting Man and Animals in making field tests of insect repellents during the 1945 ribes eradication season. The purpose of these tests was to obtain data on the comparative effectiveness of 2-phenyl cyclohexanol and standard insect repellents consisting of two different types of "Skat", one type apparently being clear dimethylphthalate and the other, which was tea-colored, containing some other ingredient.

A special report has been prepared by this office giving information on the procedure used in the field tests, number of reports and insect specimens submitted, and a brief statement giving the district leaders' estimates of the results of these insect repellent tests and their recommendations as to which repellent was desirable for use in the future.

A total of 185 reports on field tests were submitted, as well as 93 collections of insect specimens. Report forms were received from all but one district, with an average of 7.1 reports per district, which should give representative data for the region. The data forms and the insect specimens were forwarded to the Division of Insects Affecting Man and Animals, and this agency will prepare a report on the results of such tests conducted in all regions.

The majority of the district leaders favored the 2-phenyl cyclohexanol, but 19 of the 25 leaders reporting mentioned that their men complained of the excessive burning sensation resulting from the use of this repellent, especially if applied when the skin is covered with perspiration. Apparently, the

2-phenyl cyclohexanol has varying effects on the skin of different individuals and will not cause much discomfort unless applied on sunburned areas, scratches, cuts, etc. It also causes more burning if applied when a person is perspiring, as the skin is then more sensitive.

Injuries To Temporary Federal Employees

Although 622 temporary workers were employed for 20,734 man days on Federal 3103 funds in this region during the calendar year 1945, only 17 traumatic injuries were sustained which involved medical treatment under the provisions of the Employees Compensation Act. No injuries were sustained by workers employed in Maine, New Hampshire, Rhode Island and Connecticut. The following tabulation lists the number and type of injuries, by states:

<u>State</u>	<u>Total No. of Injuries</u>	<u>Type of Injury</u>					
		<u>Ivy or Oak Poisoning</u>	<u>Fracture</u>	<u>Sprains & Bruises</u>	<u>Cuts</u>	<u>Organic</u>	<u>Miso.</u>
Vt.	3	2	1	-	-	-	-
Mass.	2	-	-	1	-	1	-
N. Y.	10	5	-	2	1	-	2
Penna.	2	-	1	-	1	-	-
Total	17	7	2	3	2	1	2

Over 41% of the total cases were due to ivy or oak poisoning. The most serious injury occurred in Vermont, where an employee fell when a ledge gave way and he sustained a broken thigh bone, which resulted in his being disabled for over 2-1/2 months. In 11 of the 17 cases, the employees did not stop work or were disabled for less than four days. The Commission disallowed one claim for compensation and paid four other employees who were disabled for two days, eight days, fifteen days, and two months, respectively, over the required three day waiting period.

Dr. Rusden recently compiled a Safety and Health Manual with special reference to the work of the Division of Plant Disease Control. It brings together in one place the measures that have been used in the different operating regions, and makes them available to key men whose responsibilities include the safety and health of the employees working under their direction. Arrangements have been made to have this manual multigraphed at the Japanese Beetle Control Office at East Orange, N. J., and copies will soon be available for all offices of the Division of Plant Disease Control.

State Compensation For Cultivated Ribes Destroyed During 1945

A total of 3,397 cultivated ribes were removed during 1945, and state compensation amounting to \$9.60 was paid to only one owner (in Massachusetts) for 24 bushes, which represents only 0.7% of the total number of cultivated ribes destroyed.

Table 45 in the Appendix gives information on cultivated ribes compensation for all years.

Nursery Sanitation Work During 1945

The environs of nine state and two privately-owned nurseries in four of the Northeastern States were examined for ribes in 1945. Only 679 wild ribes were located and destroyed on the 4,936 acres in the sanitation zones around these nurseries, which contained a total of 30,471,000 white pines at the time the control work was performed. All of the work in Pennsylvania was performed by the blister rust control leaders.

Table 11 summarizes the results of the 1945 nursery sanitation work by states, while Tables 38 to 41 in the Appendix indicate the accomplishments during the period 1930-1945 inclusive, by states and programs, and the present status of such activities.

Table 11 - Nursery Sanitation Work During 1945

State	No. Nurseries Worked		Est. Number White Pines in Nurseries Worked	Type of Work	Acreage Worked	No. Ribes Destroyed (All Wild)	Total Man Days	Ribes Per Acre	Acres Worked Per Man Day
	State	Private							
Mass.	-	1	6,000	Initial	60	77	8	1.3	7.5
Conn.	2	1	727,000	Rework	680	13	1	0.02	170.0
N. Y.	4	-	27,058,000	"	3,065	560	63	0.2	1,8.6
Penna.	3	-	2,680,000	"	1,131	29	1	0.03	282.7
All States	9	2	30,471,000	Initial	60	77	8	1.3	7.5
				Rework	4,876	602	71	0.1	68.7
				Total	4,936	679	79	0.1	62.5

Blister Rust Canker Elimination Work During 1945

A small amount of canker elimination work was done on state land in Pennsylvania and by one pine owner in Maine this year. A total of 225 white pines were examined, and 77 fatally infected trees cut down. In addition, 135 branch and 2 stem cankers were removed from 47 other diseased pines. This work required only 8 man days labor.

Tables 46 to 48 in the Appendix summarize the results of the 1945 activities, as well as all blister rust canker elimination work which has been performed in this region since 1932 by states, programs and land ownership classes.

Use of Aerial Photographs

Our Division purchased aerial photographs from the Army Map Service, A.A.A., S.C.S., and the U. S. Geological Survey, for portions of several counties in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York and Pennsylvania during 1945. There was considerable variation in the quality of the prints. All of the photographs were taken with panchromatic film, and dif-

ferentiation between hard and softwoods was difficult on those taken when the hardwoods were in leaf. This difficulty will undoubtedly be solved when photographs taken on infra-red film are available.

In New Hampshire, a former district leader who had foreign duty with the Army Map Service during the war was employed for a short period during the spring of 1945 to prepare a set of instructions for our leaders governing the interpretation of forest areas on aerial photographs. State Leader Newman, of New Hampshire, also enrolled in a two-week course at the Harvard Forest School in the interpretation of aerial photographs and the production of type maps from them.

The State of New Hampshire has appropriated funds for an aerial survey of the entire state, which may be completed in 1946, and it is anticipated that in this work infra-red film will be used. Photographs will be available at a reasonable cost for use by all state departments. The Maine Forest Service has also obtained authority for an aerial survey of Hancock County, and a bill has recently been introduced into the Massachusetts legislature for a survey of the entire state.

Many of the district leaders report that the aerial photographs are proving to be of great assistance in determining the location and area of white pine stands.

Future Control Work on State and Privately-Owned Lands

In July, 1943, a detailed plan was prepared for a five year post-war blister rust control program, with the objective of completing all necessary first and second ribes eradication work, which would make it possible to place most of the control area on a maintenance basis. Present indications are that the period of this program will have to be increased to eight or ten years and plans revised accordingly.

At the end of 1945, detail mapping was still needed on 4,030,613 acres, or 32.7% of all state and privately-owned lands in the present net control area. In addition, most of the detail maps already prepared will have to be checked in the field and any necessary corrections made, due to changes in the types resulting from logging, fire, hurricane damage, etc.

Initial control work was still needed on 1,661,298 acres of state and privately-owned lands at the end of 1945, and there were 5,798,994 acres which should be examined to determine the need for rework.

Table 12 gives detail information, by states, on the mapping and ribes eradication work needed on state and privately-owned lands at the end of 1945.

Table 12 - Control Work Needed on State and Privately-Owned Lands
As of December 31, 1945

State	Total Acreage of Net Control Area	Acreage in Net Control Area In Need Of			Percentage of Net Control Area In Need Of		
		Detail Mapping	Initial Erad.	Examina- tion *	Detail Mapping	Initial Erad.	Examina- tion *
Maine	2,465,149	392,122	322,470	1,692,621	15.9	13.1	68.7
N. H.	3,071,519	1,685,319	247,991	1,889,880	54.9	8.1	61.5
Vt.	763,989	27,256	304,223	172,525	3.6	39.8	22.6
Mass.	1,659,981	774,039	37,841	494,772	46.6	2.3	29.8
R. I.	179,869	57,143	0	0	31.8	0	0
Conn.	479,187	0	0	2,664	0	0	0.6
N. Y.	2,899,127	962,482	537,629	1,105,554	33.2	18.5	38.1
N. J.	16,742	16,742	0	0	100.0	0	0
Penna.	789,696	115,510	211,144	440,978	14.6	26.7	55.8
All States	12,325,259	4,030,613	1,661,298	5,798,994	32.7	13.5	47.0

* To determine need for rework.

The acreage of initial control work still to be done in New York includes 228,999 acres in scattered wood lots and plantations in the western part of the state outside the present districts. The protection work in this part of the state will probably be supervised by the state district foresters.

Expenditures For Project BLR-3-1

Federal 3103 expenditures during the calendar year 1945 totalled \$114,653.06, of which \$649.98 was expended for the salary of one appointee in Rhode Island; \$107,204.51 for wages of laborers, scouts and foremen; and \$6,798.57 for miscellaneous expenses, chiefly the operating and maintenance costs of government-owned trucks used for crew transportation. Over 93% of all the Federal 3103 money was spent for wages of temporary personnel.

State and local cooperative expenditures and contributed services for Project BLR-3-1 totalled \$101,072.42, which is \$13,580.64 less than the total amount spent by the Federal Government. However, the 3103 allotments to the states for the fiscal year 1946 included \$74,143.00, which did not have to be matched on a dollar for dollar basis. Also, we have been advised it is not necessary for the states to match federal expenditures for overtime pay which amounted to \$7,828.32 during the calendar year 1945. Consequently, excluding such overtime costs and any expenditures from Federal 3103 allotments for the fiscal year 1946 which did not have to be matched on a dollar for dollar basis, the states and local cooperators met their obligations during the current calendar year.

Table 13 lists all expenditures and contributed services for Project BLR-3-1 during the calendar year 1945, while Table 14 gives a comparison of Federal 3103 expenditures and state and local cooperative expenditures and contributed services for this project during the fiscal years 1942 to 1945, inclusive.

Table 13 - Total Expenditures and Contributed Services For Work Project BLR-3-1 During Calendar Year 1945

State	State and Local Cooperative Expenditures and Contributed Services							B.E. & P.Q. 3103.14	Grand Total	
	Cash Expenditures				Value of Contributed Services					
	State Funds	Towns	Counties	Indiv.	Contributed Services		Total			
					State	Counties				Indiv.
Maine	5,655.02	7,066.77	-	-	530.00	-	4.50	13,256.29	17,256.17	30,512.46
N. H.	8,282.58	9,649.05	-	-	1,846.49	-	-	19,778.12	15,880.45	35,658.57
Vt.	890.30	5,693.73	-	32.80	830.87	-	-	7,447.70	11,873.65	19,319.35
Mass.	4,413.29	106.60	-	27.95	1,068.00	-	-	5,615.84	10,316.27	15,932.11
R. I.	2,973.61	-	-	-	1,115.94	-	-	4,089.55	2,190.48	6,280.03
Conn.	5,091.15	1,066.81	-	-	552.50	-	-	6,710.46	5,198.27	11,908.73
N. Y.	22,125.44	1,456.66	11,055.89	295.60	5,299.92	1,106.25	-	41,339.76	44,317.04	85,656.80
Penna.	2,069.70	-	-	-	765.00	-	-	2,834.70	7,622.73	10,457.43
All States	51,501.09	25,039.62	11,055.89	356.35	12,008.72	1,106.25	4.50	101,072.42	114,653.06	215,725.48

Classification of B.E. and P.O. 3103.14 Expenditures For Project BLR-3-1 During Calendar Year 1945

State	Salaries of Appointees			Wages of Laborers, Socuts and Foremen			Non-Labor Expenses	Total
	Base Pay	Overtime	Total	Base Pay	Overtime	Total		
Maine	-	-	-	14,303.59	1,192.23	15,495.82	1,760.35	17,256.17
N. H.	-	-	-	14,297.00	695.50	14,992.50	887.95	15,880.45
Vt.	-	-	-	10,225.58	907.23	11,132.81	738.84	11,871.65
Mass.	-	-	-	8,729.68	639.16	9,368.84	947.43	10,316.27
R. I.	649.98	-	649.98	1,287.10	157.76	1,444.86	95.64	2,190.48
Conn.	-	-	-	4,465.31	162.30	4,927.61	270.66	5,198.27
N. Y.	-	-	-	39,398.72	3,237.81	42,636.53	1,680.51	44,317.04
Penna.	-	-	-	6,669.21	536.33	7,205.54	117.19	7,622.73
All States	649.98	-	649.98	99,376.19	7,828.32	107,204.51	6,798.57	114,653.06

Table 14 - State and Local Cooperative Expenditures and Contributed Services
For Project BLR-3-1 In Relation To Federal 3103 Expenditures During
Fiscal Years 1942-1945, Inclusive

State	State and Local Cooperative Expenditures and Contributed Services For Project BLR-3-1	Federal 3103 Expenditures		Excess or Deficit in State and Local Cooperative Expenditures and Contributed Services Over Federal 3103 Expenditures
		Total	Amount To Be Matched*	
Maine	\$51,369.73	\$51,207.21	\$44,717.48	+ \$6,652.25
N.H.	43,748.69	38,928.64	33,857.47	+ 9,891.22
Vt.	14,113.07	19,101.59	16,689.31	- 2,576.24
Mass.	25,221.92	24,502.55	21,506.23	+ 3,715.69
R.I.	12,386.66	6,825.63	6,222.95	+ 6,163.71
Conn.	21,260.50	14,075.80	12,290.12	+ 8,970.38
N.Y.	152,615.09	131,352.98	113,981.04	+ 38,634.05
Penna.	12,981.27	13,568.72	11,437.73	+ 1,543.54
All States	333,696.93	299,563.12	260,702.33	+ 72,994.60

*Excludes cost of overtime pay.

The first allotments of Federal 3103 money for control work on state and privately-owned lands were made available July 1, 1941. During the fiscal years 1942-1945, inclusive, state and local cooperative expenditures and contributed services for Project BLR-3-1 in all states, except Vermont, have exceeded Federal 3103 expenditures by quite a wide margin, the total for the region being \$72,994.60.

Table 15 - Status of B.E. and P.Q. 3103.14 Funds for Fiscal Year 1946

State	Total L/A Allotment for Fiscal Year	L/A Expenditures from July 1. to December 31, 1945					Unexpended Balance of L/A Allotment on Jan.1, 1946
		Wages of Laborers*			Non-Labor Expenses	Total	
		Base Pay	Overtime	Total			
Maine	\$ 33,200	\$11,833.79	\$ 679.75	\$12,513.54	\$ 811.95	\$13,325.49	\$ 19,874.51
N.H.	37,600	12,240.45	253.38	12,493.83	627.94	13,121.77	24,478.23
Vt.	18,050	7,273.43	265.92	7,539.35	486.45	8,025.80	10,024.20
Mass.	16,850	7,655.08	412.59	8,067.67	515.21	8,582.88	8,267.12
R.I.	2,604	737.10	43.86	780.96	43.01	823.97	1,780.03
Conn.	7,700	2,840.91	124.14	2,965.05	216.21	3,181.26	4,518.74
N.Y.	62,639	32,455.22	1,711.26	34,166.48	521.87	34,688.35	27,950.65
Penna.	14,600	5,043.77	281.79	5,325.56	303.53	5,629.09	8,970.91
All States	\$193,243	\$80,079.75	\$3,772.69	\$83,852.44	\$3,526.17	\$87,378.61	\$105,864.39

*To December 29, 1945 which was the end of biweekly payroll period.

PART IV

BLISTER RUST CONTROL WORK ON NATIONAL FORESTS IN NORTHEASTERN REGION

FINANCIAL PROJECT BLR-4

Our Bureau is cooperating with the U.S. Forest Service in the control of white pine blister rust on the White Mountain and Allegheny National Forests in the Northeastern Region. Initial ribes eradication work has been completed on all White Mountain National Forest areas and the majority of the units in the present net control area have been reworked twice. As a result of all this work, 72.9% of the control area on this forest is now on maintenance. Several tracts on the White Mountain National Forest, which had been examined for ribes during previous years, were discontinued from the control area with the approval of the Forest Service officials in 1943, and the white pine units where blister rust control will be maintained now coincide with the management plans for this forest. Initial control work is still required on a few hundred acres on the Allegheny National Forest in Pennsylvania and a survey conducted by the Pennsylvania blister rust control leaders in 1945 showed that 2,660 acres are also in need of rework. As a result of this survey, the control area on this forest was reduced by approximately 46%.

Some ribes eradication work has also been performed on the Green Mountain National Forest in Vermont, but most of this work was done in connection with regular cooperative control projects on state and privately-owned lands before this forest was established. District Blister Rust Control Leader Mulholland recently completed a survey to locate all white pine areas and to determine the need for control work on this forest. His report shows that only five units comprising 570 acres and containing 92 acres of white pines now need protection. Copies of Mr. Mulholland's report have been furnished the Forest Service officials and the results of the survey have been discussed in detail with Supervisor Wheeler, who is submitting recommendations to his regional office. If future control work on the Green Mountain National Forest is conducted as a special project in cooperation with the U.S. Forest Service, the results will be included under Financial Project BLR-4.

Results of 1945 Control Work

Ribes eradication activities were restricted to the Allegheny National Forest where second work was performed on 40 acres of the Millstone tract. A total of 7,855 wild ribes were removed as a result of 20 man days labor by one of District Leader DeBerti's crews. The cost of this work amounted to \$109.90, all of which was paid from Federal 3103 funds.

As a result of a survey made by the Pennsylvania blister rust control leaders during the fall of 1945, the control area on the Allegheny National Forest was reduced from 6,167 acres to 3,306 acres. There is a possibility that one additional area (Loleta) of 167 acres may also be discontinued, but this area is included in the current status of control data for this forest. Initial ribes eradication work is still needed on 606 acres in six units containing 83 acres of white pine. There are also 2,660 acres in the present net control area on this forest should also be reworked. State Leader Fatzinger prepared a detail report on the results of the 1945 survey and has conferred with

Supervisor Hemingway to obtain his approval of the proposed reductions in the control area and recommendations for future ribes eradication work. Copies of the final report on the 1945 survey will be furnished officials of the cooperating agencies at an early date. If possible, all necessary ribes eradication work on the Allegheny National Forest should be performed during 1946. The services of District Leader DeBerti will be available for technical supervision of control activities.

Table 16 - Ribes Eradication Work on National Forests, 1924-1945, Inclusive

National Forest	Program	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
				Wild & Cult.	Cult. Only		Man Days	Ribes
White Mountain	Regular	Initial	6,891	162,551	-	562	.08	26.5
		Rework	8,517	19,088	-	339	.14	2.2
		Total	15,408	201,669	-	901	.06	13.1
	C.C.C.	Initial	1,950	633,866	85	2,325	1.19	325.1
		Rework	3,799	309,521	-	1,700	.45	81.5
		Total	5,749	943,387	85	4,025	.70	164.1
	All	Initial	8,841	816,447	85	2,887	.33	92.3
		Rework	12,316	328,609	-	2,039	.17	26.7
		Total	21,157	1,145,056	85	4,926	.23	54.1
Allegheny	Regular	Initial	891	129,027	8	194	.22	144.8
		Rework	921	29,546	-	217	.24	32.1
		Total	1,812	158,573	8	411	.23	87.5
	C.C.C.	Initial	3,703	665,798	22	2,757	.75	179.8
		Rework	669	68,588	-	521	.78	102.5
		Total	4,372	734,386	22	3,308	.76	168.0
	All	Initial	4,594	794,825	30	2,981	.65	173.0
		Rework	1,590	98,134	-	738	.46	61.7
		Total	6,184	892,959	30	3,719	.60	144.4
Total	Regular	Initial	7,782	311,608	8	756	.10	40.0
		Rework	9,438	48,634	-	556	.06	5.2
		Total	17,220	360,242	8	1,312	.08	20.9
	C.C.C.	Initial	5,653	1,299,664	107	5,112	.90	229.9
		Rework	4,468	378,109	-	2,221	.50	84.6
		Total	10,121	1,677,773	107	7,333	.72	165.8
	All	Initial	13,435	1,611,272	115	5,868	.44	119.9
		Rework	13,906	426,743	-	2,777	.20	30.7
		Total	27,341	2,038,015	115	8,645	.32	74.5

Table 16 lists the gross acreages reported worked on White Mountain and Allegheny National Forest lands during the period 1924-1945, inclusive. The gross acreage worked on each forest is somewhat greater than the present net control area due to the discontinuance of many units of pine from the control area during the past two years.

Table 17 shows the current status of the ribes eradication work in the present net control areas on the White Mountain and Allegheny National Forests.

Table 17 - Status of Ribes Eradication Work in Present Net Control Areas on National Forests
December 31, 1945

National Forest	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Acreage Worked			Acreage Initial Work Still to Be Done	Acreage Now on Maintenance Basis	Percentage		
				First Work	Second Work	Other Workings			Worked Once	Worked Twice	On Maintenance
White Mt.	Maine	498	150	498	386	386	0	111	100.0	77.5	22.3
	N.H.	2,948	927	2,948	2,948	2,357	0	2,402	100.0	100.0	81.5
	Total	3,446	1,087	3,446	3,334	2,753	0	2,513	100.0	96.7	72.9
Allegheny	3,306	753	3,139	2,700	804	502	606	0	81.7	24.3	0
Total	6,752	1,840	6,585	6,146	4,138	3,255	606	2,513	91.0	61.3	37.2

Table 18 - Expenditures for Blister Rust Control on National Forests
1924-1945, Inclusive

Agency	White Mountain National Forest	Allegheny National Forest	Total
Forest Service	\$ 3,701.00	\$1,009.77	\$ 4,710.77
Bureau of Entomology & Plant Quarantine	-	109.90	109.90
Bureau of Plant Industry	75.63	207.85	283.48
State of New Hampshire	357.61	-	357.61
C.C.C.	8,096.47	7,128.69	15,225.16
Total	\$12,230.71	\$8,466.21	\$20,686.92

The costs listed in Table 18 do not include any charges for the supervisory activities of employees of the Forest Service, Bureau of Plant Industry, and the Bureau of Entomology and Plant Quarantine. The C.C.C. costs were computed on the arbitrary basis of \$1.00 per eight-hour man day for the time the enlisted men spent on the project plus 35 cents per day for subsistence in 1933, 40 cents in 1934, and 50 cents during the period 1935 to 1940, inclusive. C.C.C. expenditures also include the actual cost of technical foremen assigned to the project and estimated costs of transportation for the entire C.C.C. personnel.

PART V

BLISTER RUST CONTROL ON NATIONAL PARKS IN NORTHEASTERN REGION

FINANCIAL PROJECT BLR-5

In this region the Bureau of Entomology and Plant Quarantine is cooperating with the National Park Service in the application of blister rust control measures at Acadia National Park on Mount Desert Island, Maine, and on the Hickory Run Recreational Demonstration Area in Carbon County, Pennsylvania. However, no ribes eradication work has been performed on the latter tract since 1939. Initial control work has been completed on both of these areas, and at Acadia National Park, all necessary rework has been completed and the entire control area is now on a maintenance basis. To assure continuation of this safe condition will require periodic examinations and in some instances ribes eradication chiefly by scouting methods. The entire control area of 800 acres on the Hickory Run tract should be re-examined, as from 7-9 years have elapsed since the initial control work was performed.

ACADIA NATIONAL PARK PROJECT

Blister rust infection was generally established throughout the valuable scenic white pine areas on Acadia National Park before the control program was initiated in 1929, but the ribes eradication work since that time has been very effective in controlling this destructive disease. Field studies and general observations have shown that little or no new infection has occurred on the white pines after the areas were cleared of ribes. However, numerous diseased pines with cankers, which originated prior to the application of control measures, can be found throughout the Park. The efficiency of the control work is also indicated by the fact that an average of 43.2 bushes per acre were located and destroyed on all of the initial work, while only 4.7 and 1.1 bushes per acre, respectively, have been removed on the areas worked two and three times.

Control Activities During Calendar Year 1945

Mr. L. M. Hastings was employed by the Park Service during the period May 1 to September 28, 1945 to perform ribes scouting and supervise the work of a five-man eradication crew consisting of an experienced foreman and four local high school boys. Mr. Hastings is an experienced blister rust control worker and was assigned to the post checking project at Acadia Park during the 1941 and 1942 seasons. Crew activities did not start until June 11, 1945 and were terminated at the end of August. The crew foreman assisted Mr. Hastings on scouting work prior to June 11th and during September. District Blister Rust Control Leader Bradbury, who is headquartered at Belfast, Maine, gave technical supervision to the 1945 control activities, making several visits to the Park to train the personnel, inspect field operations, and to confer with the Park Superintendent.

At the end of 1944, there were units aggregating 2,166 acres in the control area at Acadia National Park which were in need of examination before being placed on maintenance. All of these units were worked by the crew or

scouts in 1945 as well as an additional 1,436 acres, making a total of 3,602 acres covered during the current season. Table 19 summarizes the results of the 1945 control activities by classes of work.

Table 19 - Ribes Eradication Work at Acadia National Park During 1945

Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
		Wild & Cult.	Cult. Only		Ribes	Man Days	
Second	1,249	2,816	0	187	2.3	.149	6.7
Third	2,353	2,993	1	190	1.3	.080	12.4
Total	3,602	5,809	1	377	1.6	.104	9.8

Only 5,809 ribes, or 1.6 bushes per acre, were located and destroyed on the 3,602 acres worked in 1945 as a result of 377 man days labor. On the 1,249 acres where second work was performed, an average of 6.7 acres were covered per man day as compared with 12.4 acres per man day for the third workings. The big difference in the production rates for the two classes of work is due to a larger proportion of the third work being performed by scouting methods. Also several areas of rugged topography were encountered on the second work. The ribes population was a minor factor in the production rate, as such bushes averaged only 2.3 and 1.3 per acre, respectively, on the second and third workings. Although these averages were extremely low, small concentrations of bushes were found in some portions of the areas. For example, in one unit of 141 acres where second work was performed chiefly by the crew in 1945, an average of 9.1 bushes per acre were destroyed.

The scouting work in 1945 resulted in a greatly increased production rate as compared with results during previous years. It was not possible to follow this procedure on the initial control work due to the number (43.2 bushes per acre) and general distribution of the ribes. However, now that the entire control area is on a maintenance basis, a large proportion of the work in the future can be performed by scouts, but it is essential that experienced men be employed.

Table 20 summarizes the results of all ribes eradication work at Acadia Park during the period 1929-1945, inclusive, by programs and classes of work.

Table 20 - Ribes Eradication Work at Acadia National Park
1929-1945, Inclusive

Program	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Regular	First	7,726	503,920	-	2,798	65.2	.36	2.8
	Second	3,131	23,610	1	717	7.5	.23	4.4
	Third	4,979	5,493	1	578	1.1	.12	8.6
	Total	15,836	533,023	2	4,093	33.7	.26	3.9
C.C.C.	First	12,990	390,020	293	8,429	30.0	.65	1.5
	Second	9,427	35,191	-	3,564	3.7	.38	2.6
	Total	22,417	425,211	293	11,993	19.0	.53	1.9
All	First	20,716	893,940	293	11,227	43.2	.54	1.8
	Second	12,558	58,801	1	4,281	4.7	.34	2.9
	Third	4,979	5,493	1	578	1.1	.12	8.6
	Total	38,253	958,234	295	16,086	28.0	.42	2.4

Blister Rust Canker Elimination Work

No blister rust canker elimination work has been performed at Acadia National Park since 1939 as qualified personnel were not available for such activities during the war. Based on a survey made in 1942, follow-up work is needed in the areas which were treated during the period 1932-1939 and initial treatment is also urgent to save valuable scenic white pines along important roads and trails in other sections of the Park. Recommendations have been submitted for such activities during June, 1946 and the fiscal year 1947.

Table 21 summarizes the results of all blister rust canker elimination work during the period 1932-1939, inclusive, by programs.

Table 21 - Blister Rust Canker Elimination Work at Acadia National Park
(Work performed during period 1932-1939, inclusive)

Program	Total No. Pines Examined	No. Infested Pines Cut Down	No. Infested Pines from Which Cankers Removed	No. Cankers Removed		Total Man Days
				Branch	Stem	
Regular	2,546	319	718	1,480	61	100
C.C.C.	58,261	2,957	8,879	27,054	2,691	2,177
Total	60,807	3,276	9,594	28,534	2,752	2,277

Expenditures for Blister Rust Control Work at Acadia National Park

The National Park Service allotted \$3,400.00 for blister rust control work at Acadia National Park during the fiscal year 1945. Of this amount, \$1,736.37 was expended during the period July 1 to August 30, 1944, leaving a balance of \$1,663.33 for use during May and June, 1945. However, actual expenditures during these two months amounted to only \$396.87, leaving an unexpended balance of \$766.46 in the allotment for the fiscal year 1945.

An allotment of \$2,280.00 was made for control work during the fiscal year 1946 and \$1,813.59 expended from July 1 to October 16, 1945, leaving a balance of \$466.41 available for use during May and June, 1946.

Table 22 - Expenditures for Blister Rust Control at Acadia National Park

Calendar Year 1945

<u>Item</u>	<u>May-June</u>	<u>July-Oct.</u>	<u>Total</u>
Gross salary of checker.....	\$365.00	\$ 676.39	\$1,041.39
Gross wages of crew.....	424.91	1,113.75	1,608.66
Gas, oil, etc. for truck.....	10.89	23.48	34.34
Misc. (trail paper & telephone calls)...	26.07	0	26.07
Totals.....	\$896.87	\$1,813.59	\$2,710.46

Calendar Years 1929-1945, Inclusive

	<u>Amount</u>
National Park Service.....	\$19,595.51
Bureau of Plant Industry.....	3,145.83
C.C.C.....	29,880.36
Total.....	\$52,621.70

The costs for the control project at Acadia National Park do not include any charges for the supervisory activities of employees of the Bureau of Plant Industry or Bureau of Entomology and Plant Quarantine. The C.C.C. costs were computed on the basis of an arbitrary charge of \$1.00 per eight-hour man day for the time the enlisted men spent on the project plus 35 cents per day for subsistence in 1933, 40 cents in 1934, and 50 cents during the period 1935-1942, inclusive. The C.C.C. expenditures also include the actual cost of technical foremen and checkers assigned to the project, and estimated cost of transportation for all C.C.C. personnel while on blister rust control work.

Proposed Control Work During Calendar Year 1946

Detail recommendations have been submitted to the Park Service officials for control work at Acadia National Park during May and June, 1946 and the fiscal year 1947. It is proposed that a checker and one assistant be employed on scouting work during the period May 20 to August 31, 1946. There are 5,601 acres in the control area which have been worked only once which should be scouted. Undoubtedly, the scouts can effectively remove any regrowth of ribes in most of these areas, but a few sections may be located where crew work may be necessary.

Funds are not available to conduct any blister rust canker elimination work during the balance of the current fiscal year, but it is recommended that \$825.00 be allotted to employ a foreman and four laborers on such activities during June. The proposed allotment of \$5,850.00 for control activities during the fiscal year 1947 includes funds to employ such a five-man unit on canker elimination work from July 1 to November 30, 1946. It is essential that experienced workers be obtained for the checker's and foreman's positions during 1946. The services of Mr. Hastings will not be available, but it should be possible to obtain qualified men now that the labor situation has improved. Older men rather than high school boys are preferable as laborers on the canker elimination project.

HICKORY RUN RECREATIONAL DEMONSTRATION AREA

During the period 1937-1939, inclusive, the National Park Service conducted ribes eradication work on 4,800 acres of the Hickory Run Recreational Demonstration Area in Carbon County, Pennsylvania. A total of 75,000 wild ribes were destroyed as a result of 1,318 man days labor at a cost of \$5,598.08.

A survey in 1943 by two of the Pennsylvania blister rust control leaders showed that only 800 acres, containing about 280 acres of white pine, on this tract should be retained in the permanent control area. It is recommended that funds be made available to rework the entire area of 800 acres as soon as practicable.

Table 23 - Status of Ribes Eradication Work on National Park Lands
December 31, 1945

	<u>Acadia</u>	<u>Hickory Run</u>	<u>Total</u>
	<u>National Park</u>	<u>Recreational Area</u>	
Acres of net control area.....	16,872	800	17,672
Acres of white pine in net control area.....	3,200	280	3,480
Acres worked in net control area:			
First work.....	16,872	800	17,672
Second work.....	11,271	0	11,271
Third work.....	4,979	0	4,979
Acres now on maintenance basis.....	16,872	0	16,872
Acres now requiring examination to determine need for rework.....	0	800	800
Percentage of net control area:			
Worked once.....	100.0	100.0	100.0
Worked twice.....	66.8	0	66.8
Worked three times.....	29.5	0	29.5
On maintenance.....	100.0	0	100.0
Now in need of examination.....	0	100.0	100.0

PART VI

APPENDIX

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Table 24 - Informational and Service Activities of Permanent and Temporary District Leaders During Period 1923-1945, Inclusive

Informational Activities

State	Meetings Addressed		Items Published	Displays Placed
	No.	Attendance		
Maine	1,369	37,764	605	1,079
N. H.	3,604	210,679	4,331	2,125
Vt.	1,018	35,171	660	882
Mass.	1,043	47,979	2,172	874
R. I.	265	20,160	408	132
Conn.	114	4,100	646	145
N. Y.	1,996	155,568	2,814	803
Penna.	33	3,520	38	59
All States	9,442	514,941	11,674	6,099

Service Activities

State	Initial Interviews	Follow-up Calls	Persons Instructed in Field
Maine	33,818	12,757	21,868
N. H.	39,636	38,704	22,154
Vt.	15,321	11,218	10,364
Mass.	36,391	13,381	12,530
R. I.	3,826	3,208	716
Conn.	4,610	3,498	1,686
N. Y.	35,599	26,832	25,042
Penna.	1,955	416	1,856
All States	171,156	110,014	96,216

Table 25 - Local Cooperation on Blister Rust Control Work During 1945

[illegible]

Table 26 - Local Cooperation on Bilateral Rust Control Work, 1918-1945, Inclusive

State	Individual Cooperation			Town Cooperation			County Cooperation		
	No. Cooperators		Amount Spent By Individual Cooperators	No. Town		Amount Town Money Expended	No. County Allotments or Appropriations	Amount Spent By Counties	
	Ribes Erad.	Canker Elimin.		Appropriations	Contributions				
Maine	11,104	25	85,354.48	946	20	155,688.31	-	-	
N. H.	693	-	49,031.17	1,529	20	449,918.48	6	1,724.05	
Vt.	2,352	12	75,065.54	78	64	36,703.78	-	-	
Mass.	21,842	-	102,193.09	4	57	24,225.24	-	-	
R. I.	8	-	581.36	-	-	-	-	-	
Conn.	508	-	9,988.99	88	51	29,334.26	-	-	
N.Y.	5,975	1	174,830.13	29	3	9,422.78	77	83,006.52	
Penna.	303	-	2,273.13	-	-	-	-	-	
All States	42,785	38	499,318.12	2,674	215	705,297.85	83	84,730.60	

Table 27 - Control Area Mapping Work During 1945
(All on state and privately-owned lands)

State	Acreage Mapped	Acreage Examined But Not Mapped	Miles Control Area Boundary Lines Painted	Total Man Days
N. H.	16,432	11,296	-	288
Vt.	3,002	5,800	-	19
Mass.	31,938	24,965	-	125
R. I.	5,751	3,882	-	26
Conn.	47,805	17,985	-	428
N. Y.	40,023	5,145	4 1/2	848
Penna.	34,894	-	-	11
All States	179,845	69,073	4 1/2	1,745

Table 28 - Control Area Mapping During Period 1933-1945, Inclusive
By States

State	Total Acreage Reported Mapped*	Acreage Detail Mapped in Net Control Area	Acreage Examined But Not Mapped	Miles Control Area Boundary Lines Painted	Total Man Days
Maine	2,289,913	2,073,525	4,762,969	1,808 1/2	37,476
N. H.	1,510,635	1,389,148	292,692	-	11,666
Vt.	1,667,963	736,733	4,016,425	828	23,170
Mass.	1,018,064	885,942	1,241,815	1,290	20,928
R. I.	240,785	122,726	13,013	-	2,425
Conn.	779,824	479,187	2,657,145	3,202 1/4	25,831
N. Y.	4,352,757	1,936,645	2,941,049	2,403 1/4	45,411
Penna.	847,649	677,492	2,000**	7,369	45,215
All States	12,707,590	8,301,398	15,925,108	16,901	241,922

* This acreage includes a large amount of remapping, especially in Vermont, Connecticut and New York. It also includes areas which were mapped and subsequently discontinued from the control area.

** Several hundred thousand additional acres of non-pine land were also examined but not mapped in Pennsylvania -- no record was kept of this acreage.

Table 29 - Control Area Mapping Work During Period 1933-1945, Inclusive
By Programs

Program	Total Acreage Reported Mapped	Acreage Examined But Not Mapped	Miles Control Area Boundary Lines Painted	Total Man Days
Regular Cooperative	807,796	867,761	1, 1/4	6,025
C.C.C.	999,838	364,002	2,630	38,265
P.W.A.	711,663	912,528	227	6,915
W.P.A. (F.A.)	9,239,070	11,177,457	10,678 1/2	159,211
W.P.A. (State)	656,491	399,852	3,361 1/4	26,676
E.R.A.	213,971	2,139,370	-	1,205
C.W.A.	45,761	34,138	-	592
All Programs	12,707,590	15,925,108	16,901	241,922

Table 30 - Status of Control Area Mapping Work - December 31, 1945

State	Total Acreage of Not Control Area	Acreage Detail Mapped in Not Control Area	% Not Control Area Detail Mapped
Maine	2,482,519	2,073,525	83.5
N.H.	3,074,467	1,389,148	45.2
Vt.	763,989	736,733	96.4
Mass.	1,659,981	885,942	53.4
R.I.	179,859	122,726	68.2
Conn.	479,187	479,187	100.0
N.Y.	2,899,127	1,936,645	66.8
N.J.	16,742	0	0
Penn.	723,802	677,492	85.3
All States	12,349,683	8,301,398	67.2

Table 31 - Ribes Eradication Work During 1945 By States and Land Ownership Classes

Initial Control Work
(All on state and private lands)

State	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
		Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	17,549	196,821	-	1,329	11.2	.08	13.2
N.H.	10,795	135,400	14	1,433	12.5	.13	7.5
Vt.	13,890	120,911	13	1,833	8.7	.14	7.4
Mass.	6,975	10,093	-	358	1.4	.05	19.5
N.Y.	21,834	115,305	1,366	1,384	5.3	.06	15.8
Penna.	11,379	95,319	104	1,241	8.4	.11	9.2
All States	82,422	673,849	1,497	7,628	8.2	.09	10.3

Second Workings

State	Land Ownership Class	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	State & Private	71,377	330,649	9	3,426	4.6	.05	20.8
	Acadia Nat. Park	1,249	2,816	-	187	2.3	.15	6.7
	Total	72,626	333,465	9	3,613	4.6	.05	20.1
N.H.	All State & Private	24,539	172,730	443	3,196	7.0	.13	7.7
Vt.	"	8,294	63,187	44	1,104	7.6	.13	7.5
Mass.	"	48,126	60,478	1,277	1,620	1.3	.03	29.7
R.I.	"	5,046	1,965	19	272	0.4	.05	18.6
Conn.	"	8,470	26,037	-	548	3.1	.06	15.5
N.Y.	"	129,203	475,708	45	6,964	3.7	.05	18.6
Penna.	State & Private	5,241	36,495	8	416	7.0	.08	12.6
	Allegheny Nat. Forest	40	7,855	-	20	196.4	.50	2.0
	Total	5,281	44,350	8	436	8.4	.08	12.1
All States	State & Private	300,296	1,167,249	1,845	17,546	3.9	.06	17.1
	Acadia Nat. Park	1,249	2,816	-	187	2.3	.15	6.7
	Allegheny Nat. Forest	40	7,855	-	20	196.4	.50	2.0
	Total	301,585	1,177,920	1,845	17,753	3.9	.06	17.0

Third and Other Workings

Maine	State & Private	6,325	35,320	3	285	5.6	.05	22.2
	Acadia Nat. Park	2,353	2,993	1	190	1.3	.08	12.4
	Total	8,678	38,313	4	475	4.4	.05	18.3
N.H.	All State & Private	3,078	17,554	-	411	5.7	.13	7.5
Vt.	"	883	4,611	-	134	5.2	.15	6.6
Mass.	"	8,275	12,750	3	325	1.5	.04	25.5
R.I.	"	2,515	979	-	182	0.4	.07	13.8
Conn.	"	13,477	18,193	15	588	1.3	.04	22.9
N.Y.	"	76,334	203,099	33	4,111	2.7	.05	18.6
All States	State & Private	110,887	292,506	54	6,036	2.6	.05	18.4
	Acadia Nat. Park	2,353	2,993	1	190	1.3	.08	12.4
	Total	113,240	295,499	55	6,226	2.6	.05	18.2

Table 31 - Ribes Eradication Work During 1945 By States and Land Ownership Classes (Continued)

All Work

State	Land Ownership Class	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	State & Private	95,251	562,790	12	5,040	5.9	.05	18.9
	Acadia Nat. Park	3,602	5,809	1	377	1.6	.10	9.6
	Total	98,853	568,599	13	5,417	5.8	.05	18.2
N.H.	All State & Private	38,412	325,684	457	5,040	8.5	.13	7.6
Vt.	"	23,067	188,709	57	3,121	8.2	.14	7.4
Mass.	"	63,376	83,321	1,280	2,303	1.3	.04	27.5
R.I.	"	7,561	2,944	19	454	0.4	.06	16.7
Conn.	"	21,947	44,230	15	1,136	2.0	.05	19.3
N.Y.	"	227,371	794,112	1,444	12,459	3.5	.05	18.2
Penns.	State & Private	16,620	131,814	112	1,657	7.9	.10	10.0
	Allegheny Nat. Forest	40	7,855	-	20	196.4	.50	2.0
	Total	16,660	139,669	112	1,677	8.4	.10	9.9
All States	State & Private	493,605	2,133,604	3,396	31,210	4.3	.06	15.8
	Acadia Nat. Park	3,602	5,809	1	377	1.6	.10	9.6
	Allegheny Nat. Forest	40	7,855	-	20	196.4	.50	2.0
	Total	497,247	2,147,268	3,397	31,607	4.3	.06	15.7

Table 32 - Ribes Eradication Work, 1918-1945, Inclusive
By States

State	Type of Work	Gross Acreage Reported Worked	No. of Ribes Destroyed (Wild & Cult.)	Total Man Days	Per Acre		Acres Worked Per Man Day
					Ribes	Man Days	
Maine	First	2,417,598	46,584,002	256,639	19.3	.11	9.4
	Second	883,680	13,299,366	111,070	15.0	.16	6.2
	Other	45,728	232,994	2,405	5.1	.05	19.0
	Total	3,347,006	60,116,362	403,114	18.0	.12	8.3
N.H.	First	3,199,107	56,895,968	301,992	17.8	.09	19.6
	Second	928,321	12,163,996	113,127	13.1	.12	8.2
	Other	52,687	284,377	6,612	5.4	.13	7.9
	Total	4,180,115	69,344,341	421,731	16.6	.10	9.9
Vt.	First	510,118	11,977,116	122,799	23.5	.21	11.2
	Second	178,427	2,888,751	11,268	16.2	.25	11.0
	Other	13,062	67,922	1,979	5.2	.15	6.6
	Total	701,607	14,933,789	136,046	21.3	.21	11.2
Mass.	First	2,049,232	16,830,261	129,569	8.2	.06	15.8
	Second	1,086,138	5,830,265	91,838	5.4	.08	11.8
	Other	105,423	158,134	4,134	1.5	.04	25.5
	Total	3,240,793	22,818,660	225,541	7.0	.07	14.4
R.I.	First	330,050	269,502	21,251	0.8	.06	15.5
	Second	302,404	372,940	53,300	1.2	.18	5.7
	Other	27,516	11,006	1,994	0.4	.07	13.8
	Total	659,970	653,448	76,545	1.0	.12	8.6
Conn.	First	444,293	2,496,108	39,773	5.6	.09	11.2
	Second	146,463	4,887,882	92,925	10.9	.21	11.8
	Other	79,628	103,516	3,477	1.3	.04	22.9
	Total	670,384	7,487,506	136,175	7.7	.14	7.1
N.Y.	First	2,642,337	63,159,304	697,899	23.9	.26	3.8
	Second	1,139,823	10,960,305	192,740	9.6	.17	5.9
	Other	295,249	797,172	15,874	2.7	.05	18.6
	Total	4,077,409	74,916,781	906,513	18.4	.22	11.3
N.J.	First	16,742	49,493	1,324	3.0	.03	12.6
	Second	1,417	16,971	392	12.0	.28	3.6
	Total	18,159	66,464	1,716	3.7	.09	10.0
Penna.	First	647,344	33,157,658	323,793	51.2	.50	2.0
	Second	217,708	5,507,319	155,907	25.3	.72	1.4
	Other	31,056	224,856	2,605	7.2	.08	11.9
	Total	896,108	38,889,833	482,305	43.4	.54	1.9
All States	First	12,256,821	231,419,412	1,895,039	18.9	.15	6.5
	Second	5,184,381	55,927,795	888,567	10.8	.17	5.8
	Other	650,349	1,879,977	39,110	2.9	.06	16.6
	Total	18,091,551	289,227,184	2,822,716	16.0	.16	6.4

The data for Table 32 were compiled from the state leaders' annual statistical reports. In 1937 and 1942, certain adjustments were made in the acreage figures for Maine, Vermont and Connecticut in order to make the data agree with the permanent CO-105 records.

Table 33 - Ribes Eradication Work, 1918-1945, Inclusive
By Programs

Program	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Regular Cooperative	Initial	8,593,246	107,143,871	614,935	692,179	12.5	.08	12.4
	Rework	2,845,468	14,940,303	29,754	179,612	5.3	.06	15.8
	Total	11,438,714	122,084,174	644,689	871,791	10.7	.08	13.1
C.C.C.	Initial	1,379,998	49,844,058	75,026	683,275	36.1	.50	2.0
	Rework	1,200,607	16,712,360	18,368	453,740	13.9	.38	2.6
	Total	2,580,605	66,556,418	93,394	1,137,715	25.8	.44	2.3
S.C.S.	Initial	20,451	651,804	360	9,944	31.9	.49	2.1
	Rework	10,120	18,830	-	2,485	1.9	.25	4.1
	Total	30,571	670,634	360	12,429	21.9	.41	2.5
W.P.A. (F.A.)	Initial	1,927,319	64,062,297	85,141	455,305	33.2	.24	4.2
	Rework	1,479,148	23,786,417	32,843	258,265	16.1	.17	5.7
	Total	3,406,467	87,848,714	117,984	713,570	25.8	.21	4.8
W.P.A. (State)	Initial	90,665	1,757,703	2,892	11,827	19.4	.13	7.7
	Rework	154,784	797,288	2,427	13,310	5.2	.09	11.6
	Total	245,449	2,554,991	5,319	25,137	10.4	.10	9.8
P.W.A.	Initial	179,970	7,646,550	7,297	33,419	42.5	.19	5.4
	Rework	162,541	1,373,778	5,379	16,156	8.5	.10	10.1
	Total	342,511	9,020,328	12,676	49,575	26.3	.14	6.9
C.W.A. & E.P.A.	Initial	20,547	175,737	1,600	4,500	8.6	.22	4.6
	Rework	7,704	158,892	306	3,270	20.6	.42	2.4
	Total	28,251	334,629	1,906	7,770	11.8	.28	3.6
A.R.A.	Initial	10,639	113,439	948	3,564	10.7	.33	3.0
	Rework	5,714	13,889	110	772	2.4	.14	7.4
	Total	16,353	127,328	1,058	4,336	7.8	.27	3.8
N.Y.A.	Initial	373	4,280	-	85	11.5	.23	4.4
	Rework	555	4,741	-	31	8.5	.06	17.9
	Total	928	9,021	-	116	9.7	.13	8.0
N.V.S.	Initial	1,416	19,673	65	241	13.9	.17	5.9
	Rework	286	1,274	54	36	4.5	.13	7.9
	Total	1,702	20,947	119	277	12.3	.16	6.1
All Programs	Initial	12,224,624	231,419,412	788,264	1,895,039	18.9	.16	6.5
	Rework	5,866,927	57,807,772	89,241	927,677	9.9	.16	6.3
	Total	18,091,551	289,227,184	877,505	2,822,716	16.0	.16	6.4

In Table 33 summarizing the ribes eradication work by programs, it was not possible to make the adjustments in the gross acreages reported worked which are indicated for Table 32.

In Table G (Page 33 of the 1945 omnibus tables) the data for the "Regular and Cooperative Program" include work under the A.R.A. Program as well as the Regular Cooperative Program as shown in Table 33 above.

Table 34 - Ribes Eradication Work, 1918-1945, Inclusive
By Land Ownership Classes

Ownership Class		Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed (Wild & Cult.)	Total Man Days	Per Acre		Acres Worked Per Man Day
						Ribes	Man Days	
State and Privately Owned Lands		First	12,217,870	228,839,200	1,876,626	18.7	.15	6.5
		Second	5,163,189	55,163,717	881,900	10.7	.17	5.9
		Other	640,098	1,852,988	38,111	2.9	.06	16.8
		Total	18,021,157	286,155,935	2,796,667	15.9	.16	6.1
National Forests	White Mountain	First	8,811	816,117	2,887	92.3	.33	3.1
		Second	7,516	318,091	1,828	112.2	.21	1.1
		Other	1,770	10,518	211	2.2	.01	22.6
		Total	21,157	1,145,056	4,926	51.1	.23	1.3
	Allegheny	First	1,594	791,825	2,981	173.0	.65	1.5
		Second	1,088	87,156	558	80.1	.51	1.9
		Other	502	10,978	180	21.9	.36	2.8
		Total	6,184	392,959	3,719	111.1	.60	1.7
	Total	First	13,135	1,611,272	5,868	119.9	.11	2.3
		Second	8,631	1,05,217	2,386	116.9	.28	3.6
		Other	5,272	21,191	391	1.1	.07	13.5
		Total	27,311	2,038,015	8,645	71.5	.32	3.2
National Parks	Acadia	First	20,716	893,911	11,227	113.2	.51	1.8
		Second	12,558	58,801	1,281	11.7	.31	2.9
		Other	1,979	5,493	578	1.1	.12	8.6
		Total	38,253	958,231	16,086	25.0	.12	2.1
	Hickory Run Dem. Area	All						
		First	1,800	75,000	1,318	15.6	.27	3.6
	Total	First	25,516	968,910	12,515	38.0	.19	2.0
		Second	12,558	58,801	1,281	11.7	.31	2.9
		Other	1,979	5,493	578	1.1	.12	8.6
		Total	13,053	1,033,231	17,101	21.0	.10	2.5
All Classes		First	12,255,821	231,119,112	1,895,039	18.9	.15	6.5
		Second	5,181,381	55,927,795	888,567	10.8	.17	5.8
		Other	650,349	1,879,977	39,110	2.9	.06	16.6
		Total	18,091,551	289,227,184	2,822,716	16.0	.16	6.1

Table 35 - STATUS OF RIBES BRADICATION WORK IN NET CONTROL AREA IN NORTHEASTERN REGION

DECEMBER 31, 1945

By States

State	Acreage of White Pine in Net Control Area	Total Acreage of Net Control Area	Acreage Worked			Acreage of Initial Work Still To Be Done	Acreage Now Requiring Examination To Determine Need For Rework	Acreage Now on Maintenance Basis	% Net Control Area	
			First Work	Second Work	Other Workings				Worked Once	Worked Twice
Maine	958,383	2,482,519	2,160,049	911,201	45,728	322,470	1,693,008	312,310	87.0	36.7
N.H.	1,346,149	3,074,467	2,826,476	870,974	50,670	247,991	1,890,426	317,976	91.9	28.3
Vt.	160,569	763,989	459,766	160,100	13,062	304,223	172,525	87,234	60.2	21.0
Mass.	590,881	1,659,981	1,622,440	236,539	105,423	37,841	194,772	893,208	97.7	57.6
R.I.	78,461	179,869	179,869	155,184	27,516	0	0	179,869	100.0	86.3
Conn.	79,154	479,187	479,187	317,246	79,628	0	2,664	176,523	100.0	66.2
N.Y.	828,058	2,899,127	2,361,498	1,091,986	295,249	537,629	1,105,554	506,271	81.5	37.7
N.J.	3,771	16,742	16,742	1,417	0	0	0	16,742	100.0	8.5
Penna.	144,202	793,802	582,052	132,321	31,056	211,750	444,438	90,860	73.3	16.7
All States	4,189,628	12,349,683	10,687,779	4,596,968	648,332	1,661,904	5,803,387	2,880,993	86.5	37.2

By Land Ownership Classes

State and Private Lands										
White Mt.	4,184,308	12,325,259	10,667,961	4,581,559	640,098	1,661,298	5,798,994	2,861,608	86.5	37.2
Allegheny	1,087	3,446	3,446	3,334	2,753	0	933	2,513	100.0	96.7
Total	753	3,306	2,700	804	502	606	2,660	0	81.7	24.3
Acadia	1,840	6,752	6,146	4,138	3,255	606	3,593	2,513	91.0	61.3
Hickory Run	3,200	16,872	16,872	11,271	4,979	0	0	16,872	100.0	66.8
Total	280	800	800	0	0	0	800	0	100.0	0
Total	3,480	17,672	17,672	11,271	4,979	0	800	16,872	100.0	63.8
Total	4,189,628	12,349,683	10,687,779	4,596,968	648,332	1,661,904	5,803,387	2,880,993	86.5	37.2

Table 36 - STATUS OF BLISTER RUST CONTROL WORK IN PRESENT NET CONTROL AREA IN NORTHEASTERN REGION BY STATES AND DISTRICTS
(December 31, 1945)

State	District	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked			Acreage in Control Area			Percentage of Control Area						
					First Working	Second Working	Third Working	Now on Maintenance Basis	Still in Need of First Working	Now Requiring Examination To Determine Need For Rework	Detail Mapped	Worked Once	Worked Twice	Worked Three Times	On Main- tenance	Now Needing Examina- tion For Rework	
Maine	Bradbury	344,516	87,705	309,741	250,402	66,868	10,565	69,211	94,114	154,793	89.9	72.7	19.4	3.1	20.1	27.3	44.9
	Calderara	792,082	319,075	691,052	713,350	314,603	13,870	55,595	78,732	609,400	87.2	90.1	39.7	1.8	7.0	9.9	76.9
	Curtis	877,835	400,094	606,111	831,889	391,630	2,261	115,238	45,946	681,707	69.0	94.8	44.6	0.3	13.1	5.2	77.7
	Waterville (No leader at present)	468,086	151,509	466,621	364,408	138,100	19,032	72,266	103,678	247,108	99.7	77.9	29.5	4.1	15.4	22.1	52.8
	Totals For State	2,482,519	958,383	2,073,525	2,160,049	911,201	45,728	312,310	322,470	1,693,008	83.5	87.0	36.7	1.8	12.6	13.0	68.2
New Hampshire	Baker	563,403	265,975	184,125	535,864	166,854	4,525	1,368	27,539	366,928	32.7	95.1	29.6	0.8	0.2	4.9	65.1
	Boomer	350,736	131,055	349,790	341,640	117,043	6,457	17,644	9,096	193,496	99.7	97.4	33.4	1.8	5.0	2.6	55.2
	Codman	262,622	113,643	201,599	240,120	87,722	6,451	3,509	22,502	148,071	76.8	91.4	33.4	2.5	1.3	8.6	56.4
	King	790,951	392,234	301,300	741,547	239,544	18,309	85,352	49,404	487,755	38.1	93.8	30.3	2.3	10.8	6.2	61.7
	Richardson	374,320	153,747	227,066	295,237	75,671	1,034	26,314	79,083	215,749	60.7	78.9	20.2	0.3	7.0	21.1	57.6
	Newman	732,435	289,495	125,268	672,068	184,140	13,894	183,789	60,367	478,427	17.1	91.8	25.1	1.9	25.1	8.2	65.3
	Totals For State	3,074,467	1,346,149	1,389,148	2,826,476	870,974	50,670	317,976	247,991	1,890,426	45.2	91.9	28.3	1.6	10.3	8.1	61.5
Vermont	Mulholland	257,206	51,018	257,206	133,809	74,068	2,427	8,685	123,397	80,875	100.0	52.0	28.8	0.9	3.4	48.0	31.4
	Palmer	201,296	44,874	198,293	129,237	23,564	2,791	56,577	72,059	52,974	98.5	64.2	11.7	1.4	28.1	35.8	26.3
	Rose	305,487	64,677	281,234	196,720	62,468	7,844	21,972	108,767	38,676	92.1	64.4	20.4	2.6	7.2	35.6	12.7
	Totals For State	763,989	160,569	736,733	459,766	160,100	13,062	87,234	304,223	172,525	96.4	60.2	21.0	1.7	11.4	39.8	22.6
Mass.	Brockway	818,221	311,111	369,206	815,236	539,688	21,858	651,990	2,985	146,439	45.1	99.6	66.0	2.7	79.7	0.4	17.9
	Doore	437,636	130,816	330,234	432,121	339,914	82,087	235,680	5,515	57,690	75.5	98.7	77.7	18.8	53.9	1.3	13.2
	Wheeler	404,124	148,954	186,502	374,783	76,937	1,478	5,538	29,341	290,643	46.1	92.7	19.0	0.4	1.4	7.3	71.9
	Totals For State	1,659,981	590,881	885,942	1,622,140	956,539	105,423	893,208	37,841	494,772	53.4	97.7	57.6	6.4	53.8	2.3	29.8
R. I.	White	179,869	78,461	122,726	179,869	155,184	27,516	179,869	0	0	68.2	100.0	86.3	15.3	100.0	0	0
Conn.	Miller (Litchfield Co.)	148,884	27,002	148,884	148,884	133,390	48,745	146,220	0	2,664	100.0	100.0	89.6	32.7	98.2	0	1.8
	Remainder of State	330,303	52,152	330,303	330,303	183,856	30,883	330,303	0	0	100.0	100.0	55.7	9.3	100.0	0	0
	Totals For State	479,187	79,154	479,187	479,187	317,246	79,628	476,523	0	2,664	100.0	100.0	66.2	16.6	99.4	0	0.6
	Barber	431,374	137,757	411,328	333,602	197,772	70,608	0	97,772	189,821	95.4	77.3	45.8	16.4	0	22.7	44.0
New York	Charlton	159,667	47,043	138,363	140,532	68,031	14,494	13,666	19,135	53,074	86.7	88.0	42.6	9.1	8.6	12.0	33.2
	Harpp	566,709	253,845	549,807	550,682	340,903	110,092	122,212	16,027	226,587	97.0	97.2	60.2	19.4	21.6	2.8	40.0
	Hick	145,854	27,838	114,268	128,577	52,843	20,544	26,793	17,277	50,465	78.3	88.2	36.2	14.1	18.4	11.8	34.6
	Holcomb	236,023	60,638	181,693	221,436	122,106	32,880	25,613	14,587	99,330	77.0	93.8	51.7	13.9	10.9	6.2	42.1
	Muiry	273,968	61,777	272,946	235,187	98,602	16,393	30,241	38,781	144,123	99.6	85.8	36.0	6.0	11.0	14.2	52.6
	Woolschlager	223,924	57,634	70,964	214,488	91,804	25,908	24,580	9,436	126,516	31.7	95.8	41.0	11.6	11.0	4.2	56.5
	Yops	444,818	111,613	186,368	349,203	55,739	4,330	222,057	95,615	71,060	41.9	78.5	12.5	1.0	49.9	21.5	16.0
	Counties Outside Present Districts	416,790	69,913	10,908	187,791	64,186	0	41,109	228,999	144,578	2.6	45.1	15.4	0	9.9	54.9	34.7
	Totals For State	2,899,127	828,058	1,936,645	2,361,498	1,091,986	295,249	506,271	537,629	1,105,554	66.8	81.5	37.7	10.2	17.5	18.5	38.1
	DeBerti	236,601	38,459	206,069	181,910	31,587	7,017	44,672	54,691	116,699	87.1	76.9	13.3	3.0	18.9	23.1	49.3
	Simmonds	170,746	31,834	152,237	114,571	10,621	1,423	20,159	56,175	70,892	89.2	67.1	6.2	0.8	11.8	32.9	41.5
	Penna.	Counties Outside Present Districts	386,455	73,909	319,186	285,571	90,113	22,616	26,029	100,884	256,847	82.6	73.9	23.3	5.9	6.7	26.1
Totals For State		793,802	144,202	677,492	582,052	132,321	31,056	90,860	211,750	444,438	85.3	73.3	16.7	3.9	11.4	26.7	56.0
-		16,742	3,771	0	16,742	1,417	0	16,742	0	0	0	100.0	8.5	0	100.0	0	0
-		12,349,683	4,189,628	8,301,398	10,687,779	4,596,968	648,332	2,880,993	1,661,904	5,803,387	67.2	86.5	37.2	5.2	23.3	13.5	47.0

Table 37 - Nursery Sanitation Work During 1945 By States

(All work conducted under Regular Cooperative Program)

State	Type of Work	No. Nurseries Worked	Est. No. White Pines in Nurseries Worked	Acreage Worked	No. Ribes Destroyed (All Wild)	Total Man Days	No. Ribes Per Acre	No. Acres Worked Per Man Day
Mass.	All Initial	1	6,000	60	77	8	1.3	7.5
Cenn.	All Rework	3	727,000	680	13	4	0.02	170.0
N.Y.	"	4	27,058,000	3,065	560	63	0.2	48.6
Penna.	"	3	2,680,000	1,131	29	4	0.03	282.7
All States	Initial	1	6,000	60	77	8	1.3	7.5
	Rework	10	30,465,000	4,876	602	71	0.1	68.7
	Total	11	30,471,000	4,936	679	79	0.1	62.5

Table 38 - Nursery Sanitation Work, 1930-1945, Inclusive

By States

State	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild & Cult.	Cult. Only		Ribes	Man Days
Maine	Initial	206	103,538	22	163	502.6	.79
	Rework	1,529	10,819	-	300	7.1	.20
	Total	1,735	114,357	22	463	65.9	.27
N. H.	All Rework	2,762	7,825	1	283	2.8	.10
Vt.	"	2,230	4,914	75	409	2.2	.18
Mass.	Initial	783	30,558	112	147	39.0	.19
	Rework	7,310	19,376	182	1,114	2.7	.15
	Total	8,093	49,934	294	1,261	6.2	.16
R. I.	Initial	1,780	725	565	167	0.4	.09
	Rework	18,156	4,970	184	277	0.3	.02
	Total	19,936	5,695	749	444	0.3	.02
Conn.	Initial	7,633	16,934	165	335	2.2	.04
	Rework	61,681	18,888	980	2,541	0.3	.04
	Total	69,364	35,822	1,145	2,876	0.5	.04
N. Y.	Initial	3,735	31,579	655	424	8.5	.11
	Rework	108,386	134,686	1,246	6,077	1.2	.06
	Total	112,121	166,265	1,901	6,501	1.5	.06
N. J.	Initial	795	2,114	114	109	2.7	.14
	Rework	1,050	765	-	19	0.7	.02
	Total	1,845	2,879	114	128	1.6	.07
Penna.	Initial	4,414	38,954	494	343 $\frac{1}{2}$	8.8	.08
	Rework	28,974	54,066	73	4,135 $\frac{1}{2}$	1.9	.14
	Total	33,388	93,020	567	4,479	2.8	.13
All States	Initial	19,396	224,402	2,127	1,688 $\frac{1}{2}$	11.6	.09
	Rework	232,078	256,309	2,741	15,155 $\frac{1}{2}$	1.1	.07
	Total	251,474	480,711	4,868	16,844	1.9	.07

No separate record was kept of the nursery sanitation work prior to 1930, the results of such activities being included with the regular ribes eradication work.

Table 39 - Nursery Sanitation Work, 1930-1945, Inclusive

By Program

Program	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild & Cult.	Cult. Only		Ribes	Man Days
Regular Cooperative	Initial	17,076	191,917	1,943	1,336 $\frac{1}{2}$	11.2	.08
	Rework	158,036	183,288	2,511	7,967	1.2	.05
	Total	175,112	375,205	4,454	9,303 $\frac{1}{2}$	2.1	.05
P.W.A.	Initial	415	25,600	3	11.7	61.7	.35
	Rework	15,422	14,381	96	1,356	0.9	.09
	Total	15,837	39,981	99	1,503	2.5	.09
C.C.C.	Initial	280	279	47	33	1.0	.12
	Rework	11,592	45,523	14	3,699	3.9	.32
	Total	11,872	45,802	61	3,732	3.9	.31
W.P.A. (F.A.)	Initial	590	72	45	9	0.1	.01
	Rework	29,908	11,662	119	1,742	0.4	.06
	Total	30,498	11,734	164	1,751	0.4	.06
W.P.A. (State)	All Rework	4,117	492	-	300	0.1	.07
S.C.S.	Initial	1,035	6,534	89	163	6.3	.16
	Rework	13,003	963	1	91 $\frac{1}{2}$	0.1	.01
	Total	14,038	7,497	90	254 $\frac{1}{2}$	0.5	.02
All Programs	Initial	19,396	224,402	2,127	1,688 $\frac{1}{2}$	11.6	.09
	Rework	232,078	256,309	2,741	15,155 $\frac{1}{2}$	1.1	.07
	Total	251,474	480,711	4,868	16,844	1.9	.07

Table 40 - Status of Nursery Sanitation Work - December 31, 1945

State	Nurseries Where Protection Established and Being Maintained				Acreage of Control Areas	Number Nurseries Protected During 1945	No. Additional Nurseries Which Established Zones But Now Abandoned
	Number						
	Federal	State	Private	Total			
Maine	-	1	1	2	409	-	5
N. H.	-	1	1	2	749	-	1
Vt.	-	1	-	1	333	-	-
Mass.	-	4	6	10	8,210	1	9
R. I.	-	-	-	-	-	-	6
Conn.	-	2	2	4	1,582	3	17
N. Y.	-	4	-	4	3,065	4	5
N. J.	-	1	-	1	600	-	1
Penna.	1	4	3	8	3,921	3	6
All States	1	18	13	32	18,869	11	50

Table 41 - List of Nurseries Maintaining Sanitation Zones in Northeastern States
(December 31, 1945)

	<u>Acreage of Sanitation Zone</u>
<u>Maine</u>	
Western Maine Nursery - Fryeburg, Maine	247
State Nursery - Orono, Maine	162
	<u>409</u>
<u>New Hampshire</u>	
Keene Forestry Associates - Keene, N. H.	250
State Nursery - Boscaawen, N. H.	499
	<u>749</u>
<u>Vermont</u>	
State Nursery - Essex Junction, Vt.	333
<u>Massachusetts</u>	
Department of Conservation Nursery - Amherst, Mass.	225
Department of Conservation Nursery - Bridgewater, Mass.	100
Department of Conservation Nursery - Clinton, Mass.	150
Department of Conservation Nursery - Erving, Mass.	50
Franklin Forestry Company Nursery - Shelburne Falls, Mass.	435
Kelsey Highlands Nursery - Boxford, Mass.	900
Little Tree Farms Nursery - Framingham, Mass.	725
Wyman Nursery - Framingham, Mass.	1,000
Littlefield-Wyman Nursery - No. Abington, Mass. }	4,625
Bay State Nursery - Abington, Mass. }	
	<u>8,210</u>
<u>Connecticut</u>	
Northeastern Forestry Company - Cheshire, Conn.	537
State Nursery - Barkhamstead, Conn.	492
State Nursery - Tolland, Conn.	365
Great Pond Nursery - Simsbury, Conn.	188
	<u>1,582</u>
<u>New York</u>	
State Nursery - Saratoga Springs, N. Y.	1,605
State Nursery - Lowville, N. Y.	1,150
State Nursery - Lake Clear, N. Y.	80
N. Y. State College of Forestry Nursery - Syracuse, N. Y.	230
	<u>3,065</u>
<u>New Jersey</u>	
State Nursery - Washington Crossing, N. J.	600

Table 41 - List of Nurseries Maintaining Sanitation Zones in Northeastern States (Continued)
(December 31, 1945)

Acreage of
Sanitation Zone

Pennsylvania

Clearfield State Nursery - Clearfield, Penna.	370
Greenwood State Nursery - Petersburg, Penna.	411
Mt. Alto State Nursery - Mt. Alto, Penna.	366
Rockview State Nursery - Pleasant Gap, Penna.	354
S. C. S. Nursery - Mt. Eagle, Penna.	215
Andorra Nursery - Chester Hill, Penna.	1,065
Fairview Nursery - Fairview, Penna.	559
Doyle Nursery - Seven Stars, Penna.	581
	<u>3,921</u>

All States

32 Nurseries 18,869

Table 42 - Special Ribes Nigrum Elimination Work, 1928-1945, Inclusive - By States

State	No. Properties Inspected	No. Patches Located	No. Ribes Destroyed			Total Man Days
			Nigrum	Other Cult.	Total	
Mass.	750,359	6,657	42,629*	432	43,061	7,347
R. I.	110,137	1,917	16,219	1,093	17,312	1,929
Conn.	318,344	32,695**	7,464	42,397	49,861	14,610
N. Y.	526,593	5,128	37,064	761	37,825	5,250
All States	1,705,433	46,397	103,376	44,683	148,059	29,136

* Includes 556 bushes pulled in connection with special black currant elimination project around nurseries in 1925 and 1926.

** The survey in Connecticut included all cultivated ribes. It is estimated that the number of black currant patches in that state did not exceed 1500.

Table 43 - Special Ribes Nigrum Elimination Work, 1928-1945, Inclusive - By Programs

Program	No. Properties Inspected	No. Patches Located	No. Ribes Destroyed			Total Man Days
			Nigrum	Other Cult.	Total	
Regular Cooperative	1,082,878	14,227	85,624	20,550	106,174	14,155
P.W.A.	6,157	39	7,486	-	7,486	375
W.P.A. (F.A.)	180,313	869	3,156	432	3,588	1,081
C.W.A.	195,750	5,404	-	-	-	1,850
E.R.A.	240,335	25,858	7,110	23,701	30,811	11,675
All Programs	1,705,433	46,397	103,376	44,683	148,059	29,136

C.W.A. project consisted of location work only.

Table 44 - Status of Special Ribes Nigrum Elimination Work - December 31, 1945

State	Years Work Performed	Total Number Townships in State	No. Townships Where Special Black Currant Elimination Work	
			Completed	Partially Completed
Mass.	1930-1940, Incl.	355	346*	-
R. I.	1929-1933 "	39	39	-
Conn.	1930-1935 "	169	169	-
N. Y.	1928-1940 "	996	236	39
All States	-	1,559	790	39

* Nine additional townships on islands next to mainland will not be worked.

In the other states, Ribes nigrum have been eradicated in the worked portions of the control areas in conjunction with regular control activities. Very few black currants have been found in these states.

Table 45 - State Compensation Paid For Cultivated Ribes
Destroyed During Period 1918-1945, Inclusive

State	Total No. Cult. Ribes Destroyed	No. Bushes Paid For	% Bushes Paid For	No. Persons Paid Compensation	Amount Paid in Reimbursement	Average Amount Paid Per Bush
Maine	153,065	0	-	0	0	-
N. H.	159,382	2,008	1.3	63	\$550.60	\$.274
Vt.	18,090	1,646	9.1	133	792.91	.482
Mass.	328,086	42,098	12.8	674	15,029.75	.357
R. I.	41,777	1,410	3.4	58	509.79	.362
Conn.	90,700	175	0.2	16	103.50	.591
N. Y.	181,401	16,338	9.0	1,151	5,587.99	.342
N. J.	1,842	0	-	0	0	-
Penna.	56,089	513	0.9	70	167.25	.326
All States	1,030,432	64,188	6.2	2,165	\$22,741.79	.354

No federal money has been paid for ribes compensation.

As indicated in Table 45 no compensation has been paid for the 153,065 cultivated ribes destroyed in Maine during the period 1918-1945, inclusive.

Table 45 includes 295 cultivated bushes removed in connection with control activities at Acadia National Park, and 115 cultivated ribes destroyed on National Forest land projects. No compensation was paid for such bushes removed from the control areas on these federal land projects.

Table 46 - Blister Rust Canker Elimination Work During 1945

State	Total Number Pines Examined	No. Fatally Infected Pines Cut Down	No. Infected Pines From Which Cankers Removed	Total Number Cankers Removed	Total Man Days
Maine	5	2	2	7	2
Penna.	220	75	45	130	6
All States	225	77	47	137	8

Table 47 - Blister Rust Canker Elimination Work, 1932-1945, Inclusive

By States and Programs

State	Program	Total Number Pines Examined	Number Fatally Infected Pines Cut Down	Number Infected Pines From Which Cankers Removed	Total No. Cankers Removed	Total Man Days
Maine	Regular	97,753	8,269	12,806	21,112	813
	C.C.C.	58,261	2,957	8,879	29,745	2,177
	Total	156,014	11,226	21,685	51,187	2,990
N. H.	All W.P.A. (F.A.)	28,581	5,731	638	711	219
Vt.	Regular	24,647	1,597	1,765	3,116	189
	W.P.A. (F.A.)	226,489	38,342	18,838	21,253	2,491
	W.P.A. (State)	21,457	985	786	895	367
	Total	272,593	40,924	21,389	25,264	3,047
Mass.	W.P.A. (F.A.)	116,167	14,956	3,682	4,114	3,293
	C.W.A.	4,680,000	17,303	12,784	17,511	5,409
	Total	4,796,167	32,259	16,466	21,625	8,702
N. Y.	Regular	17,350	378	51	390	82
	W.P.A. (F.A.)	1,577,875	149,379	190,702	255,076	12,420
	W.P.A. (State)	324,770	8,868	7,571	8,257	1,519
	Total	1,919,995	158,625	198,324	263,723	14,021
Penna.	Regular	220	75	45	130	6
	C.C.C.	567,018	28,308	76,048	148,522	4,564
	W.P.A. (F.A.)	352,460	4,287	53,927	110,377	2,742
	Total	919,698	32,670	130,020	569,029	7,312
All States	Regular	139,970	10,319	14,667	25,078	1,090
	C.C.C.	625,279	31,265	84,927	188,267	6,741
	W.P.A. (F.A.)	2,301,572	212,695	267,787	391,531	21,165
	W.P.A. (State)	346,227	9,853	8,357	9,152	1,886
	C.W.A.	4,648,000	17,303	12,784	17,511	5,409
	Total	8,061,048	281,435	388,522	931,539	36,291

No special blister rust canker elimination work was performed in the region prior to 1932.

Table 48 - Blister Rust Canker Elimination Work, 1932-1945, Inclusive

By Land Ownership Classes

Ownership Class	Total Number Pines Examined	Number Fatally Infected Pines Cut Down	Number Infected Pines From Which Cankers Removed	Total Number Cankers Removed	Total Man Days
State and Private Lands	8,000,241	278,159	378,928	900,253	34,014
Acadia National Park, Me.	60,807	3,276	9,594	31,286	2,277
Total	8,061,048	281,435	388,522	931,539	36,291

Table 49 - Total Expenditures For All Blister Rust Control Activities During Calendar Year 1945

By States and Cooperating Agencies

State	Federal Funds			States and Local Cooperators							Grand Total
	B.E. and P.Q.		Park Service	Total	States		Indiv.	Towns	Counties	Total	
	3101	3103			Cash	Contributed Services					
Maine	19,113.37	17,256.17	2710.46	39,080.00	5,655.02	830.00	4.50	7,066.77	-	13,556.29	52,636.29
N. H.	21,811.72	15,380.45	-	37,692.24	8,282.58	2,146.49	-	9,649.05	-	20,078.12	57,770.36
Vt.	14,155.76	11,871.65	-	26,327.41	890.30	1,460.87	32.80	5,693.73	-	8,077.70	34,405.11
Mass.	19,073.00	10,316.27	-	29,389.27	4,413.29	1,251.37	27.95	106.60	-	5,799.21	35,188.48
R. I.	649.98	2,190.48	-	2,840.46	2,973.61	1,616.10	-	-	-	4,589.71	7,430.17
Conn.	4,974.17	5,198.27	-	10,172.44	5,091.15	1,552.46	-	1,066.81	-	7,710.42	17,882.86
N. Y.	25,569.59	44,317.04	-	69,886.63	22,125.44	10,299.96	295.60	1,456.66	12,162.14	46,339.80	116,226.43
Penna.	12,519.88	7,622.73	-	20,142.61	2,069.70	895.00	-	-	-	2,964.70	23,107.31
All States	118,167.54	14,653.06	2710.46	235,531.06	51,501.09	20,052.25	360.85	25,039.62	12,162.14	109,115.95	344,647.01

* Includes contributed services amounting to \$1,106.25

Table 49 does not include Federal 3101 expenditures for the Cambridge, Mass. regional office totalling \$29,720.79 during the calendar year 1945.

**Table 50 - Total Expenditures For Blister Rust Control By All Cooperating Agencies
in Northeastern States During Period 1918-1945, Inclusive**

in Northeastern States During Period 1935-1945													
State		Maine	N. H.	Vt.	Mass.	R. I.	Conn.	N. Y.	N. J.	Penna.	All States		
States and Local Cooperators	State	174,561.35	334,042.31	68,629.96	325,878.85	86,663.26	172,721.36	1,405,496.88	16,828.15	130,634.10	2,715,456.22		
	Individuals	85,354.48	49,031.17	75,065.54	102,193.09	581.36	9,988.99	174,830.13	-	2,273.36	499,318.12		
	Towns	155,688.31	449,918.48	36,708.78	24,225.24	-	29,334.26	9,422.78	-	-	705,297.85		
	Counties	-	1,724.08	-	-	-	-	83,006.52	-	-	84,730.60		
	Total	415,604.14	834,716.04	180,404.28	452,297.18	87,244.62	212,044.61	1,672,756.31	16,828.15	132,907.46	4,004,802.79		
Federal Funds	Regular	B.P.I.	249,874.54	434,415.50	119,398.94	323,303.88	43,883.83	103,065.16	479,769.34	6,271.28	31,619.21	1,791,601.68	
		B.E. & P.Q.	3101	138,411.10	139,792.11	92,504.76	132,002.70	6,634.27	47,608.41	157,026.37	2,949.64	91,360.86	808,290.22
			3103	64,532.70	52,050.41	27,127.39	33,085.43	7,649.60	17,257.06	166,041.33	-	19,197.81	386,941.73
			Total	202,943.80	191,842.52	119,632.15	165,088.13	14,283.87	64,865.47	323,067.70	2,949.64	110,558.67	1,195,231.95
		Forest Service	284.46	3,416.54	-	-	-	-	-	-	-	1,009.77	4,710.77
		Park Service	19,595.51	-	-	-	-	-	-	-	-	5,598.08	25,193.59
		Sub-Total	472,698.31	629,674.55	239,031.09	488,392.01	58,167.70	167,930.63	802,837.04	9,220.92	148,785.73	3,016,737.99	
	Emergency	C.C.C.	355,610.43	149,340.77	95,905.47	64,503.64	111,845.63	177,053.96	774,782.95	346.50	895,066.17	2,624,455.52	
		P.W.A.	69,128.95	68,597.21	32,168.20	52,071.89	12,427.98	22,479.39	92,334.23	3,081.48	45,474.63	397,763.96	
		W.P.A.-State Program	6,597.97	20,595.37	8,685.80	17,413.66	2,700.56	232,690.84	23,587.53	-	23,507.24	335,778.97	
		W.P.A.-Federal "	649,730.76	632,428.87	402,140.28	407,457.56	48,258.65	83,153.99	1,132,151.77	7,303.37	455,814.65	3,818,439.90	
		C.W.A.	-	-	-	31,134.08	-	5,938.10	-	-	-	37,072.18	
		E.R.A.	1,426.80	-	-	10,998.20	-	94,478.40	2,779.70	-	-	109,683.10	
		A.R.A.	-	-	-	-	1,640.00	1,152.71	8,010.58	-	4,254.65	15,057.94	
		S.C.S.	-	-	-	-	5,797.19	-	9,087.87	230.25	9,613.27	24,728.58	
		N.Y.A. & N.V.S.	-	-	-	-	-	-	812.40	-	220.80	1,033.20	
		Sub-Total	1,082,494.91	870,962.82	538,899.75	583,579.03	182,670.01	616,947.39	2,043,547.03	10,961.60	1,433,951.41	7,364,013.35	
		Total Federal Funds		1,555,193.22	1,500,636.77	777,930.84	1,071,971.04	240,837.71	784,878.02	2,846,384.07	20,182.52	1,582,737.14	10,380,751.34
		Grand Total		1,970,797.36	2,335,352.81	958,335.12	1,524,268.22	328,082.33	996,922.63	4,519,140.38	37,010.67	1,715,644.60	14,385,554.13
Percentage of Total		13.7	16.7	6.7	10.6	2.3	6.9	31.4	0.3	11.9	100.0		

Table 50 does not include any expenditures for the regional office. Such expenditures during the period July 1, 1935 to December 31, 1945 were as follows: B.E. and P.Q. funds - \$185,225.38; W.P.A. project funds - \$85,107.20; and W.P.A. administrative funds - \$34,402.59. No record is available at Cambridge of Bureau of Plant Industry and P.W.A. expenditures for the regional office prior to July, 1935.

BLISTER BUST CONTROL, NORTH CENTRAL REGION, 1945

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Summary of Blister Rust Control Program, December 31, 1945

North Central Region

Blister Rust Conditions

White pine blister rust continued to intensify and to spread from established infection centers throughout the North Central Region in 1945. Intensification of the rust is pronounced in unprotected white pine areas in the northern sections of the three lake States, especially in northeastern Minnesota. While white pine infection was reported for the first time in only two counties, namely, Crawford and Ogemaw in Michigan, rust on ribes showed a southward spread. For the first time ribes infection was reported in 1945 from 1 county in Illinois; 2 in Indiana; 12 in Iowa and 7 in Ohio. Ribes infection varied in severity. In Illinois, Indiana, Ohio and the southern parts of Michigan and Wisconsin rust on ribes was generally light and difficult to find. In Iowa, Minnesota and the northern two-thirds of Michigan and Wisconsin ribes infection was heavy with abundant production of telia. Weather conditions were unusual in 1945. Abnormally warm weather occurred in March, followed by a cool, protracted spring, with damaging frosts in early June. The summer in Illinois, Indiana and Ohio was dry. Normal rainfall and cool weather prevailed in the northern part of the Region and ribes leaves were retained longer in the fall than usual, thus prolonging the opportunity for pine infection.

White Pine

During 1945 a considerable amount of preradication survey and check was performed. At the end of the year there were 1,117,352 acres of white pine in the Region listed as worth protection costs, larger by 10,185 acres, the figure reported at the end of 1944. This increase was due primarily to increases in white pine reproduction resulting from favorable growing conditions since 1937. The value of white pine in this Region was conservatively estimated in 1942 to be approximately \$104,000,000. In terms of employment in industries dependent upon the harvest and manufacture of products of white pine, this figure would be several times larger.

Local Control, 1945

During 1945 local control was accomplished with funds from the following sources: State and Private; Regular Funds including 3101 and 3103; Forest Service 3104 and Indian Service 3107 and Indian Tribal. Control work shown following performed in the Region in 1945 was materially greater than in 1944.

Working	Acres R. P. Protected	Acres Worked	Ribes Destroyed	Man-Days Used
Initial	34,231	83,907	1,677,941	15,890
Second	23,882	58,307	1,124,907	10,257
Third and Subsequent	4,688	10,915	241,317	2,752
Total	62,801	153,130	3,044,165	28,900

Status of Control

The status of control at the end of 1945 is shown for the Region in the following table:

Ownership Class	Total Control Problem Net Acres		Net Control Area			
	White Pine	Control Area	Acres		Percent	
			Initially Worked	On Main- tenance	Initially Worked	On Main- tenance
Forest Service	191,661	408,250	274,015	829,062	57.1	25.7
United Service	51,859	102,510	79,674	9,579	77.7	9.3
Nat. Park Service	15	120	120	-	100.0	-
Gov.-Fed. Public	283,680	732,370	604,706	188,112	62.6	25.7
Private	620,157	2,713,169	1,873,719	1,05,081	68.3	15.5
Total	1,047,372	3,956,419	2,532,234	1,023,834	70.0	25.5

Nursery Sanitation

Of the 83 nurseries around which ribes-free zones have been established, 55 have ceased to produce white pine planting stock in commercial quantities, and their protective zones have been abandoned. Ribes-free zones are maintained around the remaining 47 nurseries. Control has been established around 166 nurseries, and examination for ribes every two or three years is maintained. During 1945, nursery sanitation was performed around 216 nurseries in the Region. A total of 6,307 ribes was removed from 2,581 acres of sanitation zones, at a cost of \$7 man-days.

Control Area Permits

In order to prevent the replanting of cultivated ribes within control areas, the states of Illinois, Michigan, Minnesota, Ohio, and Wisconsin, under state authority, have designated control areas into which ribes may not be shipped without state approval. During 1945, there were 5,055 applications for ribes shipping permits requested, of which 5,087 were approved, and 152 rejected. Of this number, however, 97 applicants voluntarily agreed not to plant ribes.

Cultivated Black Currant Elimination

The only systematic black currant elimination in 1945 was in Iowa, where 4 plantings with 9 black currants were found, and 5 plantings with 15 plants were destroyed.

Experimental Chemical Ribes Eradication

Rather extensive experiments in the toxic effect on ribes species of 2,4-Dichlorophenoxyacetic Acid (2,4-D) and Ammate were conducted in various parts of the Region. While results cannot be definitely obtained until the spring of 1946, it appears that Ribes americanum is highly susceptible to 2,4-D; R. cynosbati, R. hirtellum, and R. missouriense moderately susceptible; and R. glandulosum and R. triste resistant. Spraying with Ammate defoliated all species, but failed to prevent production of secondary leaves.

Future Control Work

Necessarily, with the rust increasing as it is, and with the labor shortage, unavoidable loss of white pines will result. By directing efforts toward protection of the best stands of young white pine most immediately in need of the work in 1945 we hope to keep the losses to a minimum.

Summary of Blister Rust Control, 1945

Illinois

Blister Rust Conditions

Witch on pine was found in 1945 for the first time in Carroll County, Illinois. Blister infection has now been reported from 11 northern counties.

White Pine

Except for a few scattered locations of natural pine, chiefly at Pines State Park, and Shermans Peak State Park, white pine is planted, and continues to be a popular reforestation tree. There are 2,153 acres of white pine listed for protection. White pine in the State was valued at \$1,600,000 in 1945.

Local Control, 1945

All work was done on Bureau-State Funds.

Working	Ownership Class	Acres W.P. Protected	Acres Worked	Ribes Pulled	Man-Days Used
Initial	Forest Service	1	50	-	-
	Non-Fed. Public	3	181	992	12
	Private	35	2,475	-	-
	Total Initial	39	2,706	992	12
Second	Private	41	92	304	12
Third	Non-Fed. Public	282	1,564	37,000	296
	Private	63	381	4,359	37
	Total Third	345	1,945	41,359	333
Grand Total		425	3,177	42,351	347

Status of Control, December 31, 1945

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Maintenance	Initially Worked	On Maintenance
Forest Service	1	50	50	50	100.0	100.0
Non-Fed. Public	1,185	7,636	6,367	1,310	83.4	23.7
Private	966	24,587	10,869	4,166	45.5	16.9
Total	2,152	32,273	17,286	5,526	59.4	19.7

Nursery Sanitation

Sanitation done around all but one of the eight nurseries growing white pine are being maintained in a ribes-free condition. No sanitation work was done in 1945, because none was needed.

Future Control Program

A few pine areas remain to be mapped. Major emphasis will continue to be placed in protection of white pine stands, to the limit of funds and labor available, in order to place on maintenance as quickly as possible all valuable white pine stands.

Summary of Blister Rust Control, 1945

Indiana

The State Leader of work in Ohio and Indiana transferred in March, 1944 to other work. No control operations were carried on in Indiana during 1945, other than brief scouting trips, and some work on the Indiana permanent records.

Blister Rust Conditions

Ribes infection was found in 1945 for the first time in two counties: Elkhart and Steuben. Rust was light, consisting of one bush of R. cynosbati lightly infected at each of two locations. To date, no natural pine infection has been found. Ribes infection has been reported from seven northern counties.

White Pine

White pine occurs chiefly in plantations, except for a few acres of natural stands in the northwest corner of the State. White pine continues to be extensively planted, for reforestation by individuals, coal companies, and the State. There are 6,948 acres of white pine listed for protection. The value of white pine in the State was estimated in 1942 to be \$1,515,041.

Status of Control, December 31, 1945

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Maintenance	Initially Worked	On Maintenance
Forest Service	70	391	-	-	-	-
Non-Fed. Public	1,907	17,465	15,647	9,099	89.6	51.9
Private	4,891	161,251	57,031	32,356	40.1	22.5
Total	6,968	179,047	72,678	41,455	43.3	24.7

Berry Elimination

Berry elimination work is being maintained in a ribes-free condition around three of the six nurseries worked. No work was performed in 1945, but the three nurseries are in a good condition with respect to ribes.

Cultivated Black Current Elimination

No systematic cultivated black current elimination program has been performed. Judging from inspections made in the past there are few of these bushes in the State. To date, 15 bushes have been destroyed.

Future Control Program

Resumption of local control in Indiana is not contemplated until after the war when labor is available. Fortunately, rust is not spreading rapidly, and no great damage from blister rust is contemplated by this delay.

Summary of Blister Rust Control, 1945

Rust

Blister Rust Conditions

Rust on ribes was abundant and well distributed. It was found in 1945 for the first time in 12 counties, namely: Boone, Adams, Carroll, Clay, Dallas, Elletts, Greene, Hamilton, Hardin, Humboldt, Mahaska, Marion and Warren. To date, rust on pines has been found in 7 counties, and on ribes in 54 counties.

White Pine

White pine is used extensively as a shelterbelt tree, in approximately 12,000 shelterbelts in the State. Good stands, both natural and planted, are found in the northeast part. There are 5,656 acres of white pine listed for collection. Based on owners' appraisals, the value of white pine, chiefly as shelterbelts, was placed at \$9,300,000 in 1942.

Local Control

During 1945, local control was performed with Bureau-State funds on state-owned parks and forests, and private lands, as follows:

Working	Ownership Class	Acres W.P. Protected	Acres Worked	Ribes Destroyed	Man-Days Used
Initial	Non-Fed. Public	70	607	76,076	672
	Private	17	154	17,923	172
	Sub-total	87	761	93,999	844
Second	Non-Fed. Public	18	142	59,501	253
	Private	83	531	24,413	197
	Sub-total	101	673	83,914	450
Third	Non-Fed. Public	210	505	51,555	401
Grand Total		398	1,739	229,545	1,751

Status of Control, December 31, 1945

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Maintenance	Initially Worked	On Maintenance
Indian Service	45	500	500	-	100.0	-
Non-Fed. Public	526	5,238	2,883	58	89.0	1.8
Private	5,085	54,111	29,344	15,167	54.2	28.0
Total	5,656	59,649	32,727	25,225	85.4	29.8

Nursery Sanitation

Ribes-free sanitation zones are maintained around seven of the nine nurseries originally protected. The sanitation zone of 550 acres was worked in 1945 for the fourth time. There were 678 ribes destroyed at a cost of four man-days.

Cultivated Black Currant Elimination

In connection with local control and other field work, 15 cultivated black currant bushes in 5 plantings were destroyed in 1945. To date, 7,186 bushes in 1,584 plantings have been removed from white pine growing counties.

Canker Pruning

For the first time in Iowa canker pruning was performed in 1945 in White Pine Hollow. There were 8,914 white pines examined for cankers. Of these, 273 trees were cut down, and 934 cankers removed from an additional 197 trees. This work used 12 man-days.

Future Control Program

As in 1945, control work in 1946 will be largely confined to protection of pines on state-owned lands and large shelterbelts in northeastern Iowa.

Summary of Blister Rust Control, 1945

Michigan

Blister Rust Conditions

Pine infection was found for the first time in two counties in Lower Michigan, Crawford and Ogemaw Counties. Rust on ribes was particularly heavy in the northern two-thirds of the State, but in the southern third prolonged drought inhibited rust development on ribes. Pine infection to date has been reported from 46 and ribes infection from 79 of the 83 counties in the State.

White Pine

As a result of a considerable amount of survey work, changes were made in the acreages of white pine worth protection. Decreases were made because of insufficient values, and increases due to natural reproduction. There was a net loss of 2,276 acres of pine to bring the total in 1945 to 641,743 acres. The commercial value of white pine in the State was estimated in 1942 to be \$27,000,000.

Rust Control in 1945

Ribes eradication was performed on National Forest lands using F. S. Jobb funds. Work on state and private lands was done with Bureau-State funds. Work performed is shown following:

Working	Ownership Class	Acres N.F. Protected	Acres Worked	Ribes Destroyed	Man-days Used
Initial	Forest Service	624	2,716	37,817	371
	Non-Fed. Public	446	1,251	14,616	66
	Private	2,083	6,785	165,480	863
	Sub-total	3,153	10,752	217,913	1,299
Second	Forest Service	3,011	7,091	87,632	1,092
	Non-Fed. Public	1,832	4,666	111,066	526
	Private	6,512	20,442	213,146	1,417
	Sub-total	11,355	32,199	411,844	3,035
Third and Subsequent	Forest Service	1,143	2,150	53,664	493
	Non-Fed. Public	1,327	2,725	7,957	111
	Private	606	2,001	13,924	114
	Sub-total	3,076	6,876	75,545	718
Grand Total		17,584	39,827	705,302	5,352

Status of Control, December 31, 1945

Ownership Class	Total Control Problem		Set Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Maintenance	Initially Worked	On Maintenance
Forest Service	53,782	145,707	138,050	78,205	94.7	53.7
Nat. Park Service	15	120	120	-	100.0	-
Non-Fed. Public	143,237	337,045	306,019	113,180	90.8	53.6
Private	244,709	846,557	689,723	148,272	81.5	17.3
Total	441,743	1,329,429	1,133,892	339,657	85.3	29.6

Nursery Sanitation

Ribee-free sanitation zones are being maintained around seven of the 13 white pine producing nurseries originally protected. Most of these seven nurseries are in good condition with respect to ribes, and require only checking every two or three years. In 1945, sanitation zones of 1,901 acres around one Forest Service nursery, one S.O.S. nursery and two state nurseries were checked, 1,904 ribes were removed, and 39 man-days used.

Control Area Permits

During 1945, there were 1,905 requests for ribes shipping permits, of which 1,797 were granted and 108 rejected, including 68 persons who voluntarily agreed not to plant ribes.

Cultivated Black Currant Elimination

No systematic campaign was conducted in 1945. To date, 147,185 cultivated black currant bushes in 14,850 plantings have been destroyed in the State.

Canker Pruning

No canker pruning was performed in 1945. To date, 94,837 cankers have been pruned from 38,545 trees, and 291 fatally infected trees cut down.

Future Control Program

As in 1945, work planned for 1946 will include the protection of only those best young stands of white pine most immediately in need of the work, in order to make most effective use of the limited manpower available. Because of the intensification of the rust in the north, major attention will be given to young stands there.

Summary of Blister Rust Control, 1945

Minnesota

Blister Rust Conditions

No new counties were added in 1945 to the list of those where rust on either pine or ribes had been reported. To date, pine infection has been reported from 34 and ribes infection from 38 counties in the State. Intensification of the rust in unprotected areas is particularly rapid in northeastern Minnesota, due largely to favorable climatic conditions, and an abundance of ribes.

White Pine

Public agencies own about 65 percent of the 279,727 acres of white pine listed for protection. This acreage, chiefly in the northeastern part of the State, is increasing due to natural reproduction. There remains a relatively large acreage of white pine in the inaccessible portion not included in the control problem, and not yet mapped or examined. Based on stumpage and replacement values, an estimate of \$20,330,000 was given to white pine in the State in 1942.

Local Control, 1945

Ribes eradication was chiefly confined to northeastern Minnesota in 1945, using F.S. 5104 funds on National forest lands; I.R. 5107 funds on Indian Reservations; and Bureau-State funds on state lands. Work was performed out of Forest Service and State Blister Rust Control camps on the Superior National Forest, and Cloquet Valley State Forest. All work done in 1945 is shown following:

Working	Ownership Class	Acres W.P. Protected	Acres Worked	Ribes Destroyed	Man-days Used
Initial	Forest Service	855	1,164	230,765	1,587
	Indian Service	167	256	361,211	305
	Non-Fed. Public	848	1,390	131,727	1,334
	Total	1,870	2,810	723,703	3,226
Second	Forest Service	109	737	63,439	704
	Indian Service	56	113	65,307	569
	Non-Fed. Public	105	201	143,727	1,115
	Total	270	1,051	272,473	1,398
Third	Forest Service	41	75	3,973	30
	Indian Service	72	107	21,280	340
	Non-Fed. Public	175	217	15,256	177
	Private	48	49	3,562	40
	Total	336	448	23,071	587
Total 1945		2,476	4,309	987,153	5,211

Status of Control, December 31, 1945

Ownership Class	Total Control Problem		Net Control Area			
	Red Areas		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Main- tenance	Initially Worked	On Main- tenance
Forest Service	108,919	191,434	72,612	22,843	57.9	11.9
Indian Service	19,205	29,383	28,655	7,836	97.5	26.7
Non-Fed. Public	62,872	129,614	74,346	19,195	57.4	14.8
Private	88,731	277,387	207,485	36,078	74.8	13.0
Total	279,727	627,818	383,108	85,952	61.9	15.3

Nursery Sanitation

Of the 17 white pine producing nurseries originally protected, ribes-free sanitation zones have been maintained around nine of them. No sanitation work was performed in 1945.

Control Area Permits

The northeastern part of the State has been declared a control area by state authority. Ribes bushes may be shipped into this portion only under state permit. During 1945, there were 536 ribes planting permits requested, 254 granted, and 22 not granted, 17 of which were voluntarily withdrawn.

Cultivated Black Currant Elimination

No cultivated black currant bushes were destroyed in 1945. To date, 23,306 bushes in 3,260 plantings have been removed from white pine growing counties.

Canker Pruning

During 1945, to save white pines in protected stands, 8,734 cankers were removed from 4,895 white pines. To date, 140,097 cankers have been pruned from 15,197 trees.

Future Control Program

As in 1945 the work in 1946 will be chiefly confined to the Superior and Chippewa National Forests, and State and Indian Service lands in northeastern Minnesota. Because of the rapid intensification of the rust, and the limited manpower available, it is unavoidable that young white pines growing in large areas will be killed by blister rust before they can be protected. To make most effective use of manpower available, work will be concentrated, as in 1945, on the largest and best areas of young white pines most immediately in need of the work.

Summary of Blister Rust Control, 1945

Ohio

No control operations were carried on in Ohio during 1945, other than brief scouting trips, and considerable work on the Ohio permanent records.

Blister Rust Conditions

As a result of quite intensive scouting for the rust by the Area leader and others, ribes infection was found in 1945 for the first time in seven counties, namely: Columbiana, Crawford, Delaware, Franklin, Morrow, Muskingum and Perry. Only one location of infection was found in each county. In six cases light infection was found on only one bush, and in one county only light infection was discovered on several bushes. Results of scouting in 1945 indicate intensive season, rather than the previous of widespread rust on ribes. No pine infection was reported from any counties. To date, pine infection has been reported from two counties and ribes infection from 51.

White Pine

Over 85 percent of the 19,006 acres of white pine listed for protection in Ohio is planted. Based largely on owners' appraisals, it was estimated in 1942 that white pine in Ohio was valued at \$4,175,421.

Status of Control, December 31, 1945

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Maintenance	Initially Worked	On Maintenance
Forest Service	500	1,301	1,675	1,675	43.2	43.2
Man-Ped. Public	8,155	55,384	33,450	11,988	11.6	21.6
Private	12,330	367,218	111,656	54,127	39.6	14.7
Total	19,006	423,893	146,781	67,790	46.4	19.5

Nursery Sanitation

Ribes-free sanitation zones are being maintained around four of the 12 nurseries originally protected. No work was done in 1945.

Control Area Permits

During 1944, there were 2,002 requests for ribes shipping permits, of which 1,997 were granted and 5 rejected.

Cultivated Black Current Elimination

The status of this project in 1945 was the same as at the end of 1944, namely, that 75,117 cultivated black current bushes in 8,406 plantings had been destroyed.

Future Control Program

A resumption of control work is planned in the spring of 1946 when the State Leader vacancy is expected to be filled. There has been and continues to be great activity in white pine planting, and blister rust control is running behind. In the meantime white pine plantings are being recorded in the permanent records, so that data will be up-to-date when the program is resumed.

Summary of Blister Rust Control, 1945

Wisconsin

Blister Rust Conditions

No rust on pines or ribes was found for the first time in new counties. To date, pine infection has been reported from 58 of the 71 counties in the State, and ribes infection from all of them. Weather conditions were favorable for rust development in 1945, and ribes infection was heavy. There was a rapid rate of rust intensification in unprotected pine stands, and this rate continues.

White Pine

As a result of surveys performed in 1945, the 392,117 acres of valuable white pine listed for protection at the end of 1945 was an increase of 9,639 acres of white pine over the figure reported in 1944. This increase was chiefly composed of natural white pine reproduction. Commercial value of Wisconsin's white pine was estimated at \$36,906,615 in 1942.

Local Control, 1945

Ribes eradication in 1945 was performed on National Forests using 3104 funds; on Indian Reservations using 3107 funds, supplemented by Tribal funds on the Menominee Indian Reservation; and on state and private lands using Bureau-State funds. As in 1943 and 1944, Indian women were used successfully in ribes eradication crews. White women made up eradication crews on the Chequamegon National Forest. As ribes eradication laborers, women are particularly good in areas not supporting large bushes. Work done in 1945 is shown following:

Working	Ownership Class	Acres R.F. Protected	Acres Worked	Acres Destroyed	Man-Days Done
Initial	Forest Service	5,647	5,285	447,096	3,089
	Non-Fed. Public	1,156	2,006	72,192	664
	Private	24,079	59,589	122,101	685
	Total	30,882	66,880	641,389	4,438
Second	Forest Service	1,525	2,712	129,447	1,147
	Indian Service	962	1,536	149,309	1,221
	Non-Fed. Public	4,242	9,560	70,727	898
	Private	5,121	10,451	126,335	2,118
	Total	11,850	24,259	475,828	5,384
Third	Forest Service	168	526	6,781	213
	Indian Service	268	650	22,628	446
	Total	436	1,176	29,409	659
Grand Total		43,168	92,315	1,146,626	10,481

Finances of Control, December 31, 1945

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Favorable	
	White Pine	Control Area	Initially Worked	On Main-tenance	Initially Worked	On Main-tenance
Forest Service	25,369	66,327	61,428	6,089	92.6	9.4
Indian Service	32,609	72,627	50,515	1,743	69.6	2.4
Non-Fed. Public	67,694	181,985	159,994	32,828	87.9	12.1
Private	253,445	1,018,328	737,821	135,716	72.5	27.5
Total	379,117	1,339,267	1,009,758	176,376	75.4	24.6

Ribwort Sanitation

Ribwort-free sanitation zones are being maintained around 10 of the 17 white pine producing nurseries in the State. These 10 nurseries are now in a sanitary condition with respect to ribwort, and require only periodical checking to maintain ribwort-free conditions. During 1945, the sanitation zone around one nursery was checked. A total of 3,725 ribwort was removed from 130 acres of sanitation zone, at a cost of 24 man-days.

Control Area Permits

White pine areas protected against the rust, and posted as such under State authority are declared to be control areas. No ribwort may be shipped within the State without State approval. During 1945, there were 1,552 applications made, of which 1,572 were approved and 17 rejected, 12 of which voluntarily.

Cultivated Black Currant Elimination

No work under this project was performed in 1945. To date, 37,051 cultivated black currant bushes in 6,597 plantings have been removed from white pine growing counties.

Future Control Program

As in 1945, limited funds and labor available for control work in 1946 will be used on those young stands of white pine most immediately in need of protection. Owing to the rapid intensification of the rust in unprotected stands in the north, work will be concentrated in that portion. Over-age men, teen-age boys, white and Indian women as laborers will probably continue to be the chief sources of labor.

Detailed Narrative Report, 1945

Foreword

As initiated in 1942, the organization of the 1945 report follows the same pattern. It is divided into four main parts, so arranged that separate parts will be available covering control work on National Forests and Indian Reservations to these respective agencies. The four divisions are listed below:

(1) BLR-1-3. Leadership, Coordination and Technical Direction. This includes summaries, general narrative section, and tables covering all activities. Local control work is included for completeness.

(2) BLR-3-5. Cooperative Blister Rust Control on State and Privately Owned Lands. This includes tables and a discussion by states of work done and status of control on lands in non-federal public and private ownership.

(3) BLR-4. Blister Rust Control Operations on National Forests. This includes tables and discussions of work done and status of control on each of the 11 white pine growing National Forests in this Region.

(4) BLR-7. Blister Rust Control Operations on Indian Reservations. This includes tables and discussions of work done and status of control on each of the 10 Indian Reservations producing white pine in this Region.

BLR-1-3. Leadership, Coordination and Technical Direction of White

Pine Blister Rust Control, North Central Region

Organization

Permanent Organization

The permanent organization in 1945 is shown in the accompanying chart. It is similar to that in 1944 except for the following changes:

Mr. William F. Bens terminated military furlough and resumed work in the Milwaukee Office on May 16, 1945, filling a newly created position of Property and Procurement Clerk, CAF-4.

Mr. Aaron H. Glasgow terminated military furlough and resumed work in his position as Administrative Assistant in the Milwaukee Office, CAF-9, on July 16, 1945.

Mr. Paul A. Auge, who had been filling the position of Administrative Assistant during Mr. Glasgow's absence on military duty, was transferred to the position of Administrative Assistant in the Oakland, California Regional Office. His pay period in the Milwaukee Office ended on July 29, 1945.

ORGANIZATION CHART, NORTH CENTRAL REGION, 1945

Regional Office, Milwaukee, Wisconsin
Regional Leader, Henry M. Putnam, P-5
Asst. Regional Leader, Vacancy P-4
Administrative Asst., Aaron H. Glasgow, CAP-9
5 Clerk-Stenogr., CAP-3 to CAP-4

Southern Area
Milwaukee, Wisconsin
Area Leader
 Leighton E. Nelson, P-3

Illinois
Belvidere
Asst. Area Leader
 E. D. Bergeson, (a)

Indiana
Indianapolis
Asst. Area Leader (b)
 Vacancy

Iowa
Des Moines
Asst. Area Leader
 E. L. Wilson, P-2

Ohio
Wacolet
Asst. Area Leader (b)
 Vacancy, P-2

Michigan
Lansing
State Leader
 J. E. Kroeber, P-3

Upper Michigan
Escanaba
District Leader
 Leiland W. Stratton, P-2

Lower Michigan
Benaygo
District Leader
 W. L. Thompson, P-2

Minnesota
St. Paul
State Leader
 L. B. Ritter, P-3

Eastern District
Duluth
District Leader
 D. M. Stewart, P-2

Western District
Walker
District Leader
 J. N. Licks, P-2

Southern District
North Branch
District Leader
 W. B. Doell, P-2

Wisconsin
Madison
State Leader
 T. F. Douba, P-3

Eastern District
Antigo
District Leader
 Ray Weber, P-2

Western District
Menominee
District Leader
 E. W. Clemensby, P-2

Southern District
Madison
District Leader
 Vacancy, P-2

(a) - Held from State Funds.
 (b) - Covers work in Indiana also.

Dr. E. A. Soney started working on August 7, 1945 in a P-2 position in the Milwaukee Office concerning studies in spread of the rust and effectiveness of control throughout the North Central Region.

Mr. Harry G. Laer, who left the position of District Leader, Southern Wisconsin, for military service received his honorable discharge in the spring of 1945 but accepted private employment instead of returning to his former position, which is still vacant.

Mrs. Ethel Parker, CAF-3, transferred from the Bureau of Animal Industry, Lansing, Michigan, to the position of Clerk-Stenographer, CAF-3, in the Michigan State Leader's Office, Lansing, Michigan, effective November 13, 1945. Formerly this position had been filled by a state employee.

Mr. W. S. Doell, formerly Southern Minnesota District Leader, P-2, ended military furlough and resumed his former position on December 4, 1945.

Two other members of our permanent organization, Mr. Glen R. Allison, District Leader, P-2, in Upper Michigan, and Spar M. Sager, District Leader, P-2-a1 in Upper Michigan, were still in military service on December 31, 1945.

Labor Conditions

As in 1944, most common sources of labor in 1945 were over-age men, teen-age boys, Indian women, and a few white women. The slowing up of war work following V-J Day did not have an appreciable effect on labor for ribes eradication. The season was nearing its close. Hourly wage rates of \$.6198 in Wisconsin, Michigan and Iowa, and \$.6698 in Illinois and Minnesota were too low to attract men laid off from war work. Many of these men received \$20 to \$25 per week in unemployment relief, nearly as much as we could offer them for a 40-hour work week.

There was an abnormal amount of turnover in ribes eradication labor, chiefly because of low rates. This was true even in the case of high school boys. A considerable loss of effective work resulted, because of the disproportionate use of entirely inexperienced labor.

Our greatest lack was in trained supervisors. In handling high school boys as crew laborers, the presence of experienced and competent field supervisors is particularly important.

Cooks for our camps in Minnesota were difficult to find and retain. Cooks were in demand because of the logging and other woods operations going on. These companies were forced to pay high wages to retain their cooks, and we had to meet such wages. Because of the shortage of cooks and the necessity for providing meals seven days per week, it was necessary to employ cooks on a full, seven-days-per-week basis. Battering and food shortages added to the difficulties in retaining cooks.

In addition to the above automotive equipment we borrowed from the Forestry Tradeflexion Project and used on Elletts East Control the following automobiles:

1939 Chevrolet Pick-up truck. 7 cars
 1939 Plymouth Pick-up truck. 1 car
 1940 Chevrolet Panel 1/2 ton truck . . . 1 car

Total 9 cars

GOVERNMENT AUTOS IN USE, 1945, BIRTH CONTROL REGION

Make	Model	Year	On hand Jan. 1, 1945	Per- changed to 1945	Sold or Declared Surplus 1945	On hand Jan. 1, 1946
<u>Passenger Cars</u>						
Ford 50	Tutor	1937	4	0	0	4
Ford 85	Tutor	1939	1	0	0	1
Chevrolet	Standard Coach	1935	1	0	0	1
Chevrolet	Standard Coach	1939	1	0	0	1
Chevrolet	Standard Coach	1940	2	0	0	2
Studebaker	Champion Coach	1941	2	0	0	2
Chevrolet	Sedan, 4-Door	1940*	0	1	0	1
Pontiac 6	Sedan, 4-Door	1937	1	0	0	1
<u>TOTAL PASSENGER CARS</u>			<u>21</u>	<u>1</u>	<u>0</u>	<u>21</u>
<u>Trucks</u>						
Ford	Pick-up	1937	3	0	0	3
Ford	Sedan Delivery	1940	1	0	0	1
Chevrolet	Sedan Delivery	1937	2	0	0	2
Chevrolet	Sedan Delivery	1939	3	0	0	3
Chevrolet	Pick-up	1940	1	0	0	1
Chevrolet	Sedan Delivery	1940	1	0	0	1
Plymouth	Pick-up	1939	20	0	1	19
Dodge	Pick-up	1935	3	0	1	2
Dodge	1-1/2 Ton	1939	2	0	0	2
<u>TOTAL TRUCKS</u>			<u>38</u>	<u>0</u>	<u>1</u>	<u>37</u>
<u>TOTAL GOVERNMENT VEH.</u>			<u>59</u>	<u>1</u>	<u>1</u>	<u>58</u>

* - Obtained by purchase from Division of Disease Survey,
 U.S.D.A., Madison, Wisconsin.

Automotive accidents

There were four automotive accidents involving government-owned cars in 1965, one of which was the most serious ever sustained in the basic fiscal segment. One slight accident occurred in 1964, not previously reported. During 1964 a total of 237,096 miles were traveled in 48 government-owned automobiles, and in 1965, 54 government cars were driven 311,800 miles. Thus, in 1964 there was one accident per 237,096 miles of travel, and in 1965, one per 76,090 miles. For both years the rate was one accident per 110,000 miles. Details of the accidents are shown following:

1. Plymouth Pick-up, 1939 - License A-5206

Driver - E. J. Boyer

Passenger - None

Place - Kenosha, Iowa

Date of accident - April 20, 1964

Cause - While government car was parked along sidewalk apparently another car backed into it damaging the fender. Guilty party not found. No witnesses to accident.

Damage to Government car - Fender dented.

Repairs - About \$10.00 cost made at government expense.

Damage to Other car - Not known.

Injuries - None reported.

2. Plymouth Pick-up, 1939 - License A-5212

Driver - Mary G. Sandberg

Passenger - None

Place - Deer Virginia, Minnesota

Date of accident - October 15, 1965

Cause - In making a right hand turn, on down grade,

front wheel on road caused front wheels to roll

to right, and truck plunged off driveway into tree.

Damage - front bumper sprung, left front of frame

twisted out of line, left hand lamp damaged, radiator shell bent.

Repairs - \$77.00 payment by government authorized.

Injuries - None.

3. Chevrolet Coach, 1960 - License A-5207

Driver - L. E. Kitter

Passenger - B. E. Polson

Other car - Chrysler, 1961 - License Minn. 363-066

Driver, Other car - Florio Constantine

Passenger, Other car - Mrs. Peters

Place - Deer Creek Marsh, Minnesota

Date of accident - August 9, 1965, at dusk.

Cause - The Chrysler coach was practically at a standstill

with left wheel on center line of a three-lane highway

one half mile south of Deer Marsh city limits.

preparatory to making a right hand turn into a driveway.

It was dark. Children were playing on the left hand side

of the highway. Mr. Ritter, traveling in same direction behind the other car about 40 miles per hour, slammed on his brakes and slid his tires a paved distance of 102 feet. He did not dare go left of the Chrysler because of danger of hitting children. The front end of government car struck rear of Chrysler, squarely but lightly.

Damage to Government Car - Heavy rear bumper of Chrysler slid above bumper on government car damaging both front fenders, hood, left hood panel, lower baffle plate.

Damage to Private Car - Three small dents in trunk cover, one small dent in right rear fender.

Repairs to Government Car - \$68.75 paid by government. Bill submitted to driver of Chrysler for reimbursement to U. S. Treasury. No record of payment.

Repairs to Chrysler Sedan - Not known. Paid by Mr. Ritter's insurance company.

Injuries - None.

4. Chevrolet Panel Truck, 1940 - License 4-5178

Driver - D. F. Weddworth

Passengers - None

Other Car - Ford, Model 8, 1938, License Mich. R.G. 2435

Driver, Other Car - Orville Perkins

Passengers - Unknown

Place - Mio, Michigan

Date of Accident - August 17, 1945, night time.

Cause - Government car parked over-night. Driver of other car stated his steering gear became defective and he hit parked government car.

Damage to Government Car - Left rear fender crushed. Panel in body above fender slightly dented.

Repairs - Repaired by driver of other car. No cost to government.

Damage to Other Car - Left front fender crushed.

Repairs - Repaired by owner.

Injuries - None.

5. Chevrolet 1-1/2 Ton Truck, 1935 - License A-5226

On loan to Blister Rust Control by Forest Service.

Driver - James E. Law

Passengers - High school boys, laborers on blister rust control as follows:

Ray E. Carlson,	Paul J. Estenson
Orville Reinrich	John M. Law
Raymond E. Nelson	William J. Underwood
Albert E. Dwyer	

Other Car - Greyhound Bus 1945, license C-319

Driver - Earl Williams

Passengers - The bus's passengers

Place - Approximately four miles southwest of Grand Marais, Wisconsin, on Highway 61.

Date of Accident - 5:20 A.M. August 1, 1945

Cause of Incident - The government truck was proceeding southward from Grand Marais with six high school laborers in body of truck and one boy in cab with driver. As government was turned left to usual parking place it was hit by Greyhound Bus. The government truck was pushed across side of by the force of impact. The government truck driver does not remember making a left turn signal. The Greyhound Bus was traveling fast because it was behind schedule.

Damage to Government Truck - Canopy and whole part of truck destroyed. Left side of platform damaged. Left rear door shell and outside tire rim and damaged. Rear differential housing cracked. Right rear door broken.

Repairs to Government Truck - Estimated at \$75.00. Work not performed because of age of truck.

Damage to Greyhound Bus - Right front door crumpled and bent. Right front corner of bus body smashed in. Right front head end fog lights broken. Glass of destination sign broken.

Repairs - Unknown. Done by Bus Company.

Injuries to Government Truck - all eight men sustained injuries to greater or less degree. They were treated by Dr. Smith at Grand Marais the day of the accident, released that same day to return to camp, and visited by Dr. Smith at camp the following day. One boy, Roy E. Carlson, was pinned under the cab but miraculously escaped serious injury. The list of injured was as follows:

1. Roy E. Carlson - Injury to chest, ribs. Both arms broken. He remained in camp until August 7 when he returned home in Chicago, Illinois. Form C.A. 16 "Request for Treatment" was sent to U. S. Marine General Hospital, Chicago.
2. Earl J. Salomonson - Right knee, patella bruised and lacerated, left side of mandible scraped, left elbow lacerated. He remained in camp until August 6 when he returned home to Clooming Prairie, Minnesota. Form C.A. 16 addressed to Dr. E. J. Martin, Clooming Prairie, Minnesota prepared.
3. Leslie Heinrich - Right hand and wrist, ulnar bone, bruised and scraped. Right thigh posterior, just below buttocks scraped and bruised. He remained in camp until August 7, when he went to his home in Duck City, Minnesota. He planned to return to work August 13.
4. James B. Lee - Driver of government truck. Right shin scraped and skinned. Remained in camp until August 2, when he returned to work.
5. Jack W. Lee - Eyebrow region from right eye to right ear scraped and lacerated. He remained in camp until August 6, when he returned to work.

6. Raymond M. Nelson - lacerated right index finger, fracture of right little finger. He remained in camp until August 6, when he returned to his home in Blooming Prairie, Minnesota. Form O.I. 16 prepared, addressed to Dr. E. J. Jassin, Blooming Prairie, Minnesota.
7. William J. Underwood - strain of adductor muscle tendon in right groin. He remained in camp until August 6, when he resumed work.
8. Albert B. Torgue - (bony) loose, painful and tender os odontoides noticed. apparent fracture of fourth sacral vertebrae. He remained in camp until August 7, when he returned to his home in St. Louis Park, Minnesota. A.I. 16 prepared, addressed to Dr. W. O. Harry, Minneapolis, Minnesota.

Injured in Greyhound Bus

1. Mrs. M. E. Goodrich - cut on lower lip.
2. Mrs. E. J. Wackerneigel - stated that two of her front teeth were loosened.
3. Another passenger later complained of leg injury, but this was not reported to his driver, and he did not know the name of this woman.

Additional Information - Suit has been filed against the Greyhound Bus Company for damages by Albert B. Torgue. The Greyhound Bus Company has petitioned to have James E. Lam, driver of the government truck, named as co-defendant with the Greyhound Bus Company.

Compensation Cases

During 1945, there were 21 compensation cases processed through the Milwaukee Office: all of these injuries occurred in Michigan, Minnesota and Wisconsin. Eight of them were in connection with an automobile accident near Grand Marais, Minnesota. Details of these injuries are shown in the section entitled "Automobile Accidents." There were 21 injury cases for men employed on 5101 and 5103 buses. For the 7th six-months of such employment, this is an average of 27.63 injuries per 1,000 man-months, the highest rate since 1934, due chiefly to the serious automobile accident.

Number of Injury Cases, Processed Through the Milwaukee Office
1945, by State

State	Eye Injury	Eye and Other Facial Poisoning	Infection	Cuts, Lacerations, Fractures and Bruises	Total
Michigan	-	2	2	1	5
Minnesota	2	-	2	11*	15
Wisconsin	1	-	1	1	3
Total	3	2	4	13	22
Lost Time, Days	0	30	7	79	116

* - 8 in connection with one automobile accident near Grand Marais, Minn.
** - Only two days lost covered by general annual leave.

Authorization and Sources of Funds

As in the past several years, the work in 1945 was continued under agreements of agreement drawn up between the responsible State Agencies and the Bureau of Entomology and Plant Quarantine. These, with the exception of the one agreement with Iowa in 1945, and other agreements governing similar work are shown in the 1946 Biennial Annual Report, and are not repeated here. Shown following is the Memorandum of Agreement with Iowa, drawn up and signed in 1945.

MEMORANDUM OF AGREEMENT BETWEEN

THE IOWA STATE DEPARTMENT OF AGRICULTURE, THE IOWA STATE CONSERVATION COMMISSION, THE IOWA AGRICULTURAL EXPERIMENT STATION, THE BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE, UNITED STATES DEPARTMENT OF AGRICULTURE

CONCERNING

COOPERATIVE WORK IN CONTROLLING WHITE PINE BLISTER RUST IN IOWA.

The white-pine blister rust is an introduced forest tree disease of foreign origin which has been reported from 23 states. This disease is fatal to the 6 native species of white or 5-needled pines in this country. The 3 commercial species, eastern white pine, western white pine, and sugar pine have an estimated stumpage value in excess of \$500,000,000 and are of high importance to the economic welfare of many communities engaged in the logging, lumbering and milling industries. In addition, there are millions of acres of young growth of high potential crop value, as well as large and valuable aesthetic, recreational, watershed and amenity values that are threatened by this disease. Pine areas in the infested regions can be protected against the rust by suppression of the alternate hosts (currants and gooseberries, collectively called Ribes) within and near the pine stands. These plants may be removed from the pine-growing areas of the country primarily to prevent serious losses in white pine stands and to permit natural reforestation of these areas with white pine to form the next crop. The disease kills the young trees so rapidly that natural reforestation of pine areas is impossible unless the Ribes are removed and kept suppressed on these areas. There are about 25,000,000 acres of land from which Ribes must be removed to protect white pines of commercial importance. Ribes growth must also be kept suppressed on this acreage to assure the continued production of white pines. On account of the extensive areas involved and the necessity of keeping parts of these areas periodically to keep the Ribes suppressed by removing any that have developed from seed or sprouts, it is recognized that this work will have to be continued systematically over a period of several years to establish and maintain control of the disease in the important white pine areas of the country. The cost of control work is economically feasible when compared with the value of the crop protected, and the wide interest in

and the usefulness and great value of the white pines as forest, timber, watershed, shelterbelt and ornamental trees, justify the participation of the Federal and State government in the control of this destructive disease wherever the pine values are great.

"The Bureau of Entomology and Plant Quarantine is concerned with the control and prevention of the spread of the white pine blister rust in the United States, including the determination of the spread of the rust, the control of the disease in the white pine-producing areas of the country, especially on federal lands, the retarding of interstate spread, the development and improvement of control methods, the conducting of adequate educational work to inform the public of the rust situation, and the coordination of control plans and needs in the various states and regions into effective control programs to maintain the requisite standards for the protection of the pine.

"The State of Iowa is primarily concerned with the control of the disease within the State, through the systematic application of local control, the enforcement of State laws pertaining to this work, and the regulation of the interstate movement of the host plants which spread the disease. The work incident to the control and prevention of spread of white pine blister rust includes activities involving Federal and State responsibility and can be most effectively carried out cooperatively.

- "I. Purpose: The object of this memorandum is to outline a basis for cooperative work to control and prevent the spread of the white pine blister rust in Iowa.
- "II. Legal Authority: Appropriation made to the Bureau of Entomology and Plant Quarantine in the Act making appropriations to the United States Department of Agriculture; funds appropriated or made available to the Iowa State Department of Agriculture, the Iowa State Conservation Commission, and the Iowa Agricultural Experiment Station, including funds and services contributed by individuals and local cooperating agencies; state and other enabling laws pertaining to the control of plant diseases.
- "III. Period: This memorandum of agreement shall continue indefinitely unless modified or discontinued by common consent or by notice from any one of the parties. Requests for termination or any major changes shall be submitted to the other parties for consideration not less than 90 days in advance of the effective date desired.
- "IV. Responsibility Assumed: In furthering the purpose of this Memorandum of Agreement:
 - "1. The Iowa State Department of Agriculture Agrees
 - "(1) To furnish the services of a responsible state employee whose duties shall include general charge of the cooperative program and direction of the cooperative personnel in all matters concerned with carrying out any State laws and State policies with respect to blister rust control in Iowa.

"(2) To cooperate with other State Agencies concerned and with counties, townships, cities, associations and individuals in the blister rust control program, including the eradication of ribs and diseased white pines, and in so far as practicable to utilize the facilities of its organization for furthering the cooperative work.

"(3) To enforce such State laws as may be necessary for the effective prosecution of blister rust control work.

"B. The Iowa State Conservation Commission agrees:

"(1) To furnish personnel, funds, and other facilities as may be agreed upon from time to time in accordance with needs of the work and the availability of funds; and in so far as practicable to utilize the facilities of its organization for furthering the cooperative work.

"C. The Iowa Agricultural Experiment Station agrees:

"(1) To furnish the services of a responsible expert employee whose duties shall include leadership and direction of the investigative studies and surveys related to the control of white pine blister rust, and to make such technical information available to those engaged in the control and prevention of the spread of this disease.

"D. The Bureau of Entomology and Plant Quarantine agrees:

"(1) To furnish the leadership, technical direction, coordination and overall planning for the prosecution of the control activities of the cooperating agencies in accordance with working plans mutually agreed upon by the responsible representatives of the agencies concerned.

"(2) To furnish the services of such assistant field leaders as may be agreed upon from time to time in accordance with needs of the work and the availability of funds.

"(3) To provide these and other cooperative employees with subject matter and technical information essential to the proper conduct of their work in overruling and preventing the spread of blister rust.

"(4) To enforce Federal regulations on the interstate movement of blister rust host plants.

"E. It is mutually agreed:

"(1) That detailed plans for the cooperative work shall be drawn up in advance of the season's work and approved by the properly constituted representatives of the cooperating agencies.

- "(2) That persons employed by the cooperating agencies under this memorandum and assigned to blister rust work in the State will devote their entire time to such work except as modified by mutual agreement.
- "(3) That all persons employed within the State on this work by the U. S. Department of Agriculture, Bureau of Entomology and Plant Quarantine and by its cooperators under this memorandum, shall be satisfactory to the cooperating parties, subject to the requirements of such Civil Service regulations as may be applicable.
- "(4) That such periodical reports as may be mutually agreed upon shall be prepared as needed.
- "(5) That the results of the cooperative work may be published jointly or, upon mutual agreement, by any of the cooperating parties, with due credit being given to the cooperating agencies, provided that the manuscripts shall be submitted in advance to the cooperating parties and provided further, that each agency shall be free to use the cooperative results obtained in official correspondence and in their regular reports, giving appropriate credit to the other agencies.
- "(6) That all form letters, bulletins, and any other circular matter to be mailed in penny envelopes shall be submitted in manuscript form for approval by the United States Department of Agriculture, Bureau of Entomology and Plant Quarantine before being printed or sent out.
- "(7) That expenses for these cooperative activities shall be divided in a manner that may from time to time be mutually agreed upon, Provided: That no Federal funds shall be expended in compensation for host plants destroyed.

"V. Ineligible Personnel: It is an express condition of this agreement that it shall not be assigned in whole or in part; that no member of or delegate to Congress or Resident Commissioner after his election or appointment, and either before or after he has qualified and during his continuance in office, and no officer, agent or employee of the Government shall be admitted to any share or part of this contract or agreement, or to any benefit to arise herefrom. The provisions herein with respect to the interest of members of or delegates to Congress and Resident Commissioner in this agreement shall not be construed to extend to any incorporated company where such contract or agreement is made for the general benefit of such incorporation or company (Section 3741, Revised Statutes, and Sections 114-115, Act of March 4, 1909).

"VI. This memorandum of agreement is to serve in general terms the basis on which the agencies concerned will cooperate, but does not constitute a financial obligation to serve as a basis for

...and all expenditures from Federal funds in the Department of Agriculture were in conformity with the plans outlined in this agreement of agreement and in accord with Department rules and regulations, and in such instance based upon approved financial papers, such as lease, contract, requisition, letter of authorization, etc. Expenditures made by cooperating State agencies will be in accord with their respective rules and regulations.

DATE: May 16, 1945

SIGNED: Harry D. Lass
Secretary, Iowa State Dept. of Agriculture

DATE: May 22, 1945

SIGNED: F. J. Jensen
Director, Iowa State Conservation Commission

DATE: May 12, 1945

SIGNED: E. E. Tuckman
Director, Iowa Agricultural Experiment Station

DATE: 6-7-45

SIGNED: F. E. Amundson
Chief, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

APPROVED: J. T. Underhill
Iowa Agricultural Experiment Station
Administrative

APPROVED: J. T. Underhill
Chief
Office of Experiment Stations

DATE: July 8, 1945

DATE: July 16, 1945

During 1945, work was performed on rules formulated from the following sources:

1. State and Federal

- a. Forest and Game Commission (matched by 5103 Federal)
- b. Forestry and Game (matched by 5103 Federal)

2. Federal Bureau of Investigation

- a. 5101. Game, Fish, and Wildlife, and Wildlife Division
- b. 5103. Cooperative Wildlife and Game Control on State and private lands. (Matched by State Forest and Game)
- c. 5104. Wildlife and Game Control on National Forests in Michigan, Minnesota, and Wisconsin (includes a small amount of Forest Service G.P.O. funds in Michigan)
- d. 5107. Wildlife and Game Control on Indian Reservations in Michigan and Wisconsin. (Matched by Tribal Funds on the Michigan Indian Reservation)

Spread of the Rust

With the exception of Illinois, Indiana, Ohio, southern Michigan and southern Wisconsin, where a rather protracted hot, dry summer period occurred, the weather in 1945 in the North Central Region continued to be favorable for rust development, as in each of the years since 1937. The weather was unusually warm and humid in March. This brought out foliage earlier than normal. From April through June a protracted cool period occurred. In early June there were serious frosts doing considerable damage to crops and defoliating ribes in some localities. Weather was mild in September and early October, permitting ribes to retain their leaves longer than usual, thus extending the period of pine infection.

Rust on ribes was found in 1945 for the first time in 1 county in Illinois; 2 in Indiana; 12 in Iowa; and 7 in Ohio. Ribes infection was particularly abundant in Iowa. It is probable that if time and manpower had permitted, ribes infection could have been found in several more counties in 1945 for the first time. The finding of ribes infection in Illinois, Indiana and Ohio was evidence more of intensive search than abundance of the rust. Pine infection was found in 1945 for the first time in two lower Michigan counties. The general status of rust spread at the end of 1945 in each of the States was as follows:

Illinois

No pine infection has been found in the State. As a result of limited scouting, light infection was found in early October, 1945, on one *R. missouriense* bush for the first time in Carroll County. This brings to 11 the number of counties where ribes infection has been found, all in the northern part of the State.

Indiana

No pine infection, other than imported infected pines found and destroyed in 1911, has been found in the State. In 1945, ribes infection was found for the first time in two counties, Elkhart and Steuben. Only one bush of *R. cynosbati*, lightly infected, was found at each of two locations. The summer was hot and dry. The finding of rust on ribes was an indication of intensive search rather than abundance of ribes infection. To date, rust on ribes has been found in seven northern counties.

Iowa

While pine infection was not found in 1945 in new counties, considerable intensification of rust on pines was observed in unprotected stands in northeastern Iowa, chiefly of 1941 and 1942 origin. Rust on ribes was abundant, and reported in 1945 for the first time in 12 counties as follows: Buena Vista, Carroll, Clay, Dallas, Decatur, Greene, Hamilton, Hardin, Humboldt, Mahaska, Marion, and Warren. *R. cynosbati* was most commonly found infected, although rust was also found on *R. nigrum*, *R. aureum*, cultivated gooseberry.

and curculio, *B. missouriensis*, and *B. asericeus*. Total production was heavy. If time and manpower had permitted, it is probable ribes infection could have been found in several additional new counties. To date, pine infection has been reported from 4 and ribes infection from 50 counties.

Michigan

In Upper Michigan, and the northern half of Lower Michigan, weather conditions were apparently favorable to rust development. Ribes infection was heavy and telia unusually abundant. In the southern half of Lower Michigan a summer drought apparently retarded rust development on ribes.

Pine infection was initially reported in 1945 from two counties in Lower Michigan: (a) Greenlee County, where at each of two locations five white pines were found with cankers on 1942 growth; and, (b) Ogemaw County, where one pine was found with a canker on 1944 growth. In other parts of the State where pine infection had previously been found, many cankers apparently of 1941 and 1942 origin were discovered in unprotected stands.

No ribes infection was reported from new counties. To date, rust on ribes has been found in 79 and pine infection in 45 of the 83 counties in the State.

Minnesota

No ribes or pine infection was reported in 1945 from new counties. Weather conditions were favorable. Pine infection continued to intensify in unprotected stands in the northeastern part of the State, with many cankers of 1941 and 1942 origin. Ribes infection was heavy and telia unusually abundant. To date, rust on pines has been reported from 33, and on ribes from 38 counties.

Ohio

In spite of the rather prolonged summer drought, rust on ribes was found initially in 1945 in 7 counties in the State as follows: Columbiana, Crawford, Delaware, Franklin, Mercer, Washington and Perry. Rust on ribes was light. Only one infection per county was found, and in every case but one only a single infected *R. cynosbati* bush was discovered. At one location several bushes with *Sedum* infection were seen.

No pine infection was reported from new counties, and only a few cankers found in known infection centers, chiefly because of past control work.

To date, ribes infection has been reported from 51 and pine infection from 10 of the 88 counties in the State.

Wisconsin

No pine infection was reported from new counties in 1945. Previously rust on ribes had been found in all 71 counties, and on pines from 56 counties.

Except for the south central part of the State, where a summer drought occurred, weather conditions favored rust development. Ribes infection was heavy with abundant telial development. Many snags of 1941 and 1942 origin were observed in unprotected pine stands.

White Pine

In the 1942 report a discussion was given of the intrinsic, aesthetic and protection values of white pine, and its value as a basis of employment. The commercial value alone was estimated at nearly \$104,000,000. With the inflationary trend now in progress, it is probable that in present day terms the commercial value could be set at about \$225,000,000.

In the 1943 report emphasis was placed on uses of white pine during war times, storage values in relation to other woods, and a discussion of present surpluses of white pine.

In the 1944 report there was a discussion of white pine production, cumulative and present, in the North Central Region in relation to other regions and other kinds of lumber. On the basis of data presented, it was shown that for the period 1864 to 1942, of the total calculated cut of white pine in the United States, 995,032 million board feet, 277,712 million board feet, or 70.3 percent, were produced in the three Lake States. This is significant. The essentials responsible for the original vast pineries in the Lake States - seed, soil and climate are still fundamentally unchanged. Under proper forestry, effective control of fire, insects and diseases, white pine production can be increased in the future.

Surveys made in 1945 show an increase in white pine surpluses, particularly those supporting white pine reproduction coming in during the war years since 1937. In Table 1, additional surpluses of 46,763 acres of white pine and 48,066 acres of control zone are shown. These increases are largely due to white pine reproduction. Thus, there were decreases shown in the total control problem of 14,379 acres of white pine and 53,054 acres of control zone. These reductions are chiefly due to cutting of white pine with no reproduction left, insufficient values originally, the loss of white pine from blister rust in the unprotected areas, failure of white pine plantations, etc.

For the 1945 report there follows a discussion of the effect of accelerated cutting of white pine on the control problem. No very exact data on this subject are at hand, but certain trends are apparent, and a few examples may be given. It is a matter of common observation on the part of blister rust control workers in the Region, that due to the demand for white pine lumber, and the natural desire on the part of white pine owners to realize some immediate profit, a large amount of cutting of immature white pine has taken place during the war years, and is continuing. There are few mature stands, outside of public ownership, in the Region. However, because much of the original white pine forests had been cut by the early 1900's, and white pine reproduction had become

established on some of the over-cut areas, there is a relatively substantial acreage of pole white pine in the 10 to 60 year age class. It is this white pine that is being prematurely logged since 1942. Estimates on this type of cutting are hard to obtain. Mr. Euba estimates that 50,000 acres of mostly privately-owned, pole size white pines had been cut in Wisconsin during the years 1940 to 1945. This represents, in Mr. Euba's opinion, about four times the cutting rate during ordinary times.

Figures available from the "Forest Survey" in Minnesota on December 31, 1944 are shown in the following table. Timber trees are those nine inches D.B.H. or more, and measurements are given by International Rule.

Forest Survey Figures, Minnesota, December 31, 1944

Tree Species	Estimated Volume Standing Timber 1944 (M Bd. ft.)	Production, 1935 - 1944 (M Bd. ft.)				
		Lumber and Sawed Timber	Misc. Rough Products	Piling	Wire Timber	Total
White Pine	840,000	37,000	1,200	-	-	38,200
Red Pine	530,000	25,000	1,000	1,600	8,000	35,600
Jack Pine	1,780,000	37,000	300	-	2,500	39,800
TOTAL	2,150,000	99,000	2,500	1,600	10,500	111,600

Unfortunately the period covered by the above figures, 1935 to 1944 inclusive, does not offer an indication of either normal or accelerated wartime rate of cutting. Nevertheless the figures are significant. Disregarding, for simplification, the annual increment, the continuation of the above rate of cutting would exhaust timber reserves of white pine in 22 years; of red pine in 16 years; and of jack pine in 45 years. Since the commercial rotation of white and red pine is about 100 years, and of jack pine about 50 years, it follows that the cutting rate for lumber (exclusive of pulp) is not much greater than increment, for jack pine, but is nearly 5 times and over 6 times increment rate for white pine and red pine respectively. Furthermore, the cutting rate for the past 5 years was undoubtedly higher than for the period 1935 to 1944.

There are two aspects of white pine cutting, important for the future: (1) Effect on white pine reproduction, and hence on future forests; and (2) effect on fiber growth, and consequently, on the action of the rust.

The satisfactory establishment of white pine reproduction after logging is dependent upon several factors, among which are:

1. Timber Type - If white pine cut is associated with more intolerant species, such as aspen, birch, oak, red pine or jack pine, conditions are favorable for white pine reproduction. If the tree associates are tolerant species such as maple, beech, hemlock, hardwood, the chances are that reproduction from these species will crowd out white pine.

2. Soil Type - This is quite often measured by the timber type. The light, sandy soils with high water table are more conducive to white pine reproduction than heavy, clay soils.

3. Age of white pine at cutting - If white pine is of pole size when cut and has not produced many cones, there is an insufficient cumulative volume of seed to satisfactorily restock the area to white pine.

4. Intensity of cut - If a stand is clear-cut, even if seed trees were present before logging, there is often an insufficient number of seed in the duff to properly restock the area. It is still a moot question as to the length of time white pine seeds can remain stored in the duff and still be viable when conditions are favorable for their germination and growth. Most state and federal white pine cutting regulations require the leaving of a minimum number of white pine seed trees per acre.

5. Fire - The effect of fire on subsequent restocking to white pine can be both favorable and detrimental. A single, light burn, where a seed source is present, often does not destroy all seed in the duff, and favors germination, by exposing mineral soil, and providing sunlight. On the other hand, a severe burn may destroy viable seed in the duff. Successive fires with an interval sufficient to start reproduction, but not long enough for trees to produce seeds is very injurious. Such a situation usually requires planting to reforest the area.

6. Grazing - In many areas in the Region farmers have cut white pine from their woodlots, and after cutting have allowed cattle to graze. This is detrimental to white pine reproduction, because of the severe mechanical damage to young pines, and because the trampling hardens the soil and prevents pine seed from germinating.

The general effect of logging on ribes growth is to increase it. The opening of the stand encourages growth of hitherto dormant bushes. The exposure of mineral soil stimulates germination and growth of ribes seeds. The eradication problem is greatly increased by the presence of slash after logging. It is usually unwise to attempt ribes eradication sooner than five years after logging, because of this slash, if rust conditions permit.

Several examples are at hand of white pine logging during war time.

Near Bagley, Minnesota clear cutting of pole size white pine was done in 1945 on an 80 acre privately-owned tract. These trees were predominately under 10 inches D.B.H. The trees were too immature to have produced much of a seed crop. Under the Minnesota minimum cutting regulations, revised in 1945, a white or red pine tree must have a diameter of 10 inches or more inside bark, 16 inches above ground level before it can be cut. Furthermore, 8 or more such trees per acre must be left as seed trees. These regulations do not apply if the land is to be cleared for farming. The operator claimed this particular area was being cleared for cultivation.

In northeastern Minnesota quite extensive logging of white pines is taking place. Since most of this land is in public ownership or control, the cutting is being done under regulations, on a selection basis. White pine reproduction is appearing in openings. The control problem is increased because the opening of the stands and soil disturbances are encouraging ribes growth.

Local Control Accomplishments

A more detailed discussion of local control accomplishments on the basis of ownership classes is given in the sections devoted to control work on State and private lands, Work Project HLB-3; control work on National Forests, Project HLB-4; and control work on Indian Reservations, Project HLB-7. The discussion following will pertain to the work as a whole.

Local Control in 1945

In Tables 2, 2A, and 3, local control work performed in 1945 is shown classified by States and work agencies; States and ownership classes; and ownership classes and work agencies. For the third year since Emergency Relief funds were made available in 1933, practically all of the local control work done in 1945 was performed on Regular and Cooperative funds.

Considering both initial and rework there were 82,801 acres of white pine protected by removing 3,043,605 ribes from 153,180 acres of control area at a cost of 25,289 man-days. Approximately 45 percent of the acreage covered was rework.

The amount of acreage covered in 1945, while it is small in comparison with work done under the emergency program, nevertheless, represented the largest acreage covered in any year in White Pine by using State and Regular funds alone. Production per man-day in 1945, with ribes at the rate of 19.9 per acre, and 6.6 acres worked per man-day, compares very well with similar figures of 30.3 ribes per acre, and 4.2 acres per man-day for the peak emergency program in 1937.

Due to war conditions and the need for men in the military forces and defense agencies, very careful consideration was given to obtaining the utmost in terms of pine protection, from labor expended. Furthermore, great care was taken that labor employed on ribes eradication should not be recruited in competition with farming, lumbering, or war defense activities. To avoid this criticism, ribes eradication workers were recruited mainly from high schools, over-age local inhabitants, and Indian women. A discussion concerning labor used in 1945 is given earlier in this report.

Ribes eradication in 1945 was performed with labor provided by Regular-Cooperative funds on State and private lands; by Forest Service-Regular 3104 funds in Michigan, Minnesota, and Wisconsin; and by Indian Service-Regular 3107 funds, and Tribal funds on Indian Reservations in Minnesota and Wisconsin.

The largest acreage worked was under State and private ownership, using Bureau-State funds. The next largest acreage was covered by men employed on Forest Service-Regular funds. The largest number of man-days were employed on Bureau-State funds.

Minnesota had the highest number of acres cleared of vines, followed by Michigan with Minnesota third. The largest number of vines destroyed and the greatest number of man-days was employed in Minnesota, followed by Michigan with Michigan third in these respects. Particularly in Minnesota, the general abundance of vines on areas worked on the Superior National Forest and Grand Marais Indian Reservation accounted both for the high number of vines pulled and of man-days used. The work done in Minnesota was usually the most creative since blower work is extremely active in the north portion, and in spite of all efforts is yearly killing tens of thousands of young white pines. These pines cannot be protected as yet because of the scarcity of the fuel and the quantity of land and labor to do the necessary control work. Particularly in northeastern Minnesota, careful attention was given to performing vines eradication on a large number of blocks of good white pine as possible which were said to be in immediate need of vines eradication. This was done in order to forestall inevitable losses which would have resulted if such studies had not vines eradication work been performed.

In control work was performed in Illinois and Ohio, because of the lack of a leader and organization in these States. In Illinois, the work was chiefly confined to state and private lands to maintain protection afforded by initial control several years ago. In Iowa the program was larger than usual. Men were employed in State Conservation and Bureau funds for protection of white pine under State ownership. The rapid infestation of the east, discovered in the last few years, has focused attention to the need for immediate protection work.

Status of Control

The present status of control by States and privately classes is given in Tables 1 and 2 and graphically in Charts 1 and 2. On December 31, 1945, the status of control by States including all operations is shown in the following table:

State	Control Area	Percent	
		Controlled	On Maintenance
Illinois	52,275	53.0	18.7
Indiana	175,128	10.6	43.1
Iowa	97,810	56.6	20.8
Michigan	1,729,429	85.3	25.1
Minnesota	627,518	61.0	13.7
Ohio	286,975	12.9	15.8
Wisconsin	1,592,457	75.4	11.2
Aggregate	4,950,182	57.8	21.1

It is apparent that there is still a great deal of work to be done before the white pine control program is all on a maintenance basis. While approximately 50 percent of the work has been initially worked, only 10 percent is on a maintenance basis. Thus, not only is there need for performing

total eradication or approximately 50 percent of the areas, but approximately 25 percent of that already initially worked has to be examined and possibly reworked before it is on maintenance.

From the above table it appears that Michigan, with 65 percent of its control area initially worked and 25 percent on maintenance, is the farthest advanced of all the States toward the goal of having control accomplished around all worthwhile stands. While 23 percent of the control area in Indiana and 16 percent in Ohio are shown as being on maintenance it is probable that a much higher percent can be placed on maintenance in these States when it is possible to adequately examine white pine areas in their southern portions where fires are relatively scarce or absent.

In the northern part of the three Lake States, especially in northeastern Minnesota, where on many sites white pine is the best possible crop to grow, the favorable seasons since 1937 have very markedly increased the germination and growth of white pine reproduction. This increase in the number of young white pine trees has not only extended the lower limits of white pine areas but has also materially tended to increase the stocking of these areas in existing white pine stands.

Unfortunately, however, the conditions favorable to white pine reproduction have also been favorable to rust spread and development. The net result is that in unprotected stands the rust is killing young white pines at a very much greater rate than they are coming in through natural regeneration.

During these war years when funds for blister rust control and labor are scarce, our only sound approach to the problem is to protect the very areas of the crop and to make our funds go as far as possible in saving the greatest number of white pine trees. In so doing, however, it is inevitable that millions of young white pines on tens of thousands of acres will be killed. It is hoped that in the post-war period, funds and labor will be made available so that this destruction of young white pines can be greatly lessened if not halted, and that white pine sites may be permanently cleared of rust, thus allowing future generations of white pines to grow undamaged in blister rust invaded areas.

As blister rust control workers we must look farther than saving the existing white pine crop. We must remember that the presence of rust on a good white pine site destroys not only the existing stand but prevents indefinitely the production of future white pine forests. Thousands of acres in the northern part of the three Lake States would be best utilized if they were in white pine production. Therefore, as funds and labor permit, the protection of such white pine sites must be taken into consideration in blister rust control plans.

Cumulative Local Control

In Table 6, total eradication work by workings, States, and ownership classes are shown from the time work started to and including 1945. A rough estimate of the work for initial working in Table 5 is shown and will differ from the initial

worked average in Tables 4 and 5. In the latter tables, if we work after 1944; working was lower than the other tables. More reliable worked were removed from the other tables. Such data are retained, however. In Table 6, beyond it is a statement of work done.

It may be noted in Table 6 that 5,101,095 acres were worked initially, 795,000 acres, or 15 percent worked twice; and 78,777 acres, or 1.5 percent worked more than twice.

In Table 6, river destroyed per acre are given. Since this is a cumulative value with large average and river figures, the per acre figures should be fairly representative of river abundance in the field or available class concerned. In Chart 5, the average number of rivers destroyed per acre in "All Springs" is used, in order to obtain as large a base as possible.

In order of increasing abundance of rivers, starting with the smallest number per acre, the states line up as: Indiana, Ohio, Michigan, Illinois, Wisconsin, Iowa, Minnesota. Iowa is second high probably because much of the acreage in wooded areas around settlements containing only of cultivated fields, was not counted. This reduced the amount of acres to apply against the number of rivers killed. The average number of rivers per acre in Minnesota, 125.6, is nearly half again larger than the nearest competitor, Iowa, with 90.0 rivers per acre.

On the basis of ownership classes, rivers destroyed per acre were much more abundant on Indian Reservations, 266.6 per acre, than on National Forests, 105.2 per acre, or on State and Private, 54.2 per acre.

In Table 6 a summary of river eradication, all workings, from 1944 through 1948 is given by States, ownership classes, and operating agencies. The chief value of Table 6 is to show the operating agencies which have produced river eradication on lands under varying ownerships. Thus, on lands under Forest Service ownership, Bureau funds have been used to eradicate rivers from 110,345 of the total 391,582 acres worked. On the other hand, Forest Service funds have been used to work 845 acres out of 2,446,525 acres of private lands worked. It is recommended that for land of all ownerships to be covered for rivers within the working range of a type of trained man. The working of Forest Service land by Bureau crews, and of State and private lands by Forest Service crews can thus be balanced off, one against the other.

Nursery Facilities

Work Done 1948

There were six nurseries given facilities contracts during 1948. Among them, one was the Soil Conservation Service, one was the Forest Service, three were State and one was County. There were 6,377 acres removed from 2,381 acres of control area at a cost of \$7,444,414. This work provided protection for approximately 3,000,000 white pine trees. In providing facilities against blister rust, the 1948 1949-1950 period.

zone for all ribes and one-mile wide zone for cultivated black currants are maintained. The reason for this additional protection width is because nursery stock is often grown under overhead watering systems which create more or less optimum infection conditions. In order to maintain ribes-free conditions and to insure as far as possible the production of rust-free white pine planting stock, periodic workings of white pine growing nurseries are performed at least every two years. At the present time, practically all of our white pine producing nurseries, except a few private nurseries, have been protected, and the problem involves chiefly the maintenance of this protection work. Nursery sanitation performed in 1944 is shown in table 9.

Present Status of Nursery Sanitation

The following table, taken from Omnibus Table 44, shows the present status and cumulative work done, 1918 to 1945, in nursery sanitation in this Region.

State	Number Nurseries Worked			Total Acres Worked	Total Ribes Destroyed	Total Man-Days Used
	Protective Zones		Total			
	Retained	Dropped				
Illinois	7	1	8	2,520	50,336	376
Indiana	3	3	6	5,790	11,351	57
Iowa	7	2	9	3,436	66,123	621
Michigan	7	6	13	4,686	1,112,723	16,295
Minnesota	9	8	17	5,804	1,324,789	9,011
Ohio	4	9	13	6,131	59,551	1,881
Wisconsin	10	7	17	4,965	883,201	8,213
Grand Total	47	35	82	31,301	3,220,076	29,054

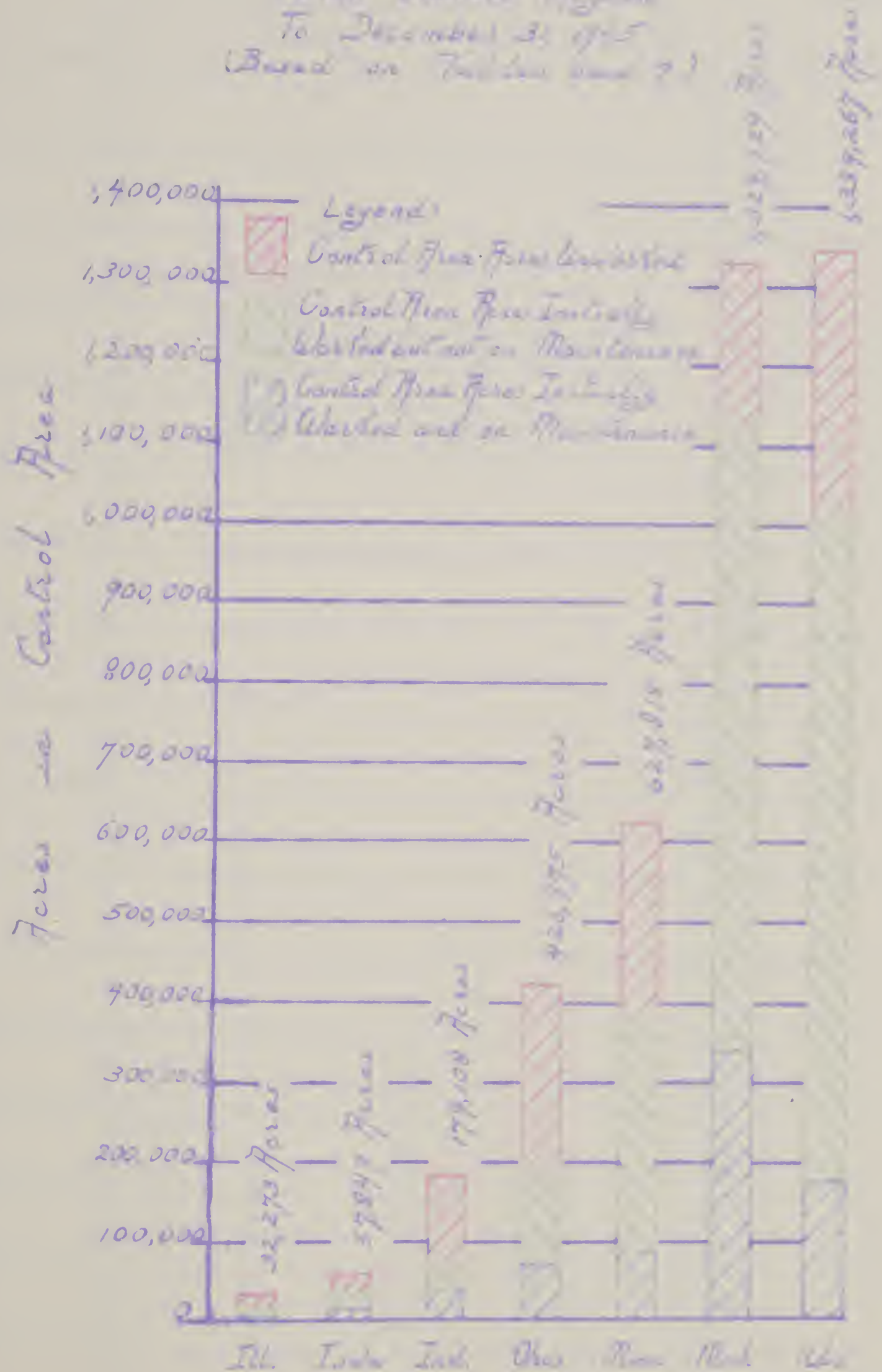
The usual reasons for not maintaining nursery sanitation zones around white pine producing nurseries are that such nurseries discontinued the growing of white pine, or the prevalence of ribes made the sanitation work too costly to maintain.

Control Area Permits

As defined in Federal Quarantine 63, the States of Michigan, Minnesota, Ohio and Wisconsin are White Pine Control Area States. The interstate movement of ribes into designated control areas within these States can only be done if each ribes shipment carries a control area permit issued by the proper State Plant Quarantine Officer. The issuing of control area permits is a function of the State which has been carried on for several years. Previous to 1945, however, no record on this activity has been made in our Annual Reports. A description of the procedure in issuing control area permits is given in the 1945 Annual Report, and will not be repeated here.

CHART 1

Status of Control of States in North Central Region
To December 31, 1945
(Based on Table and 2)



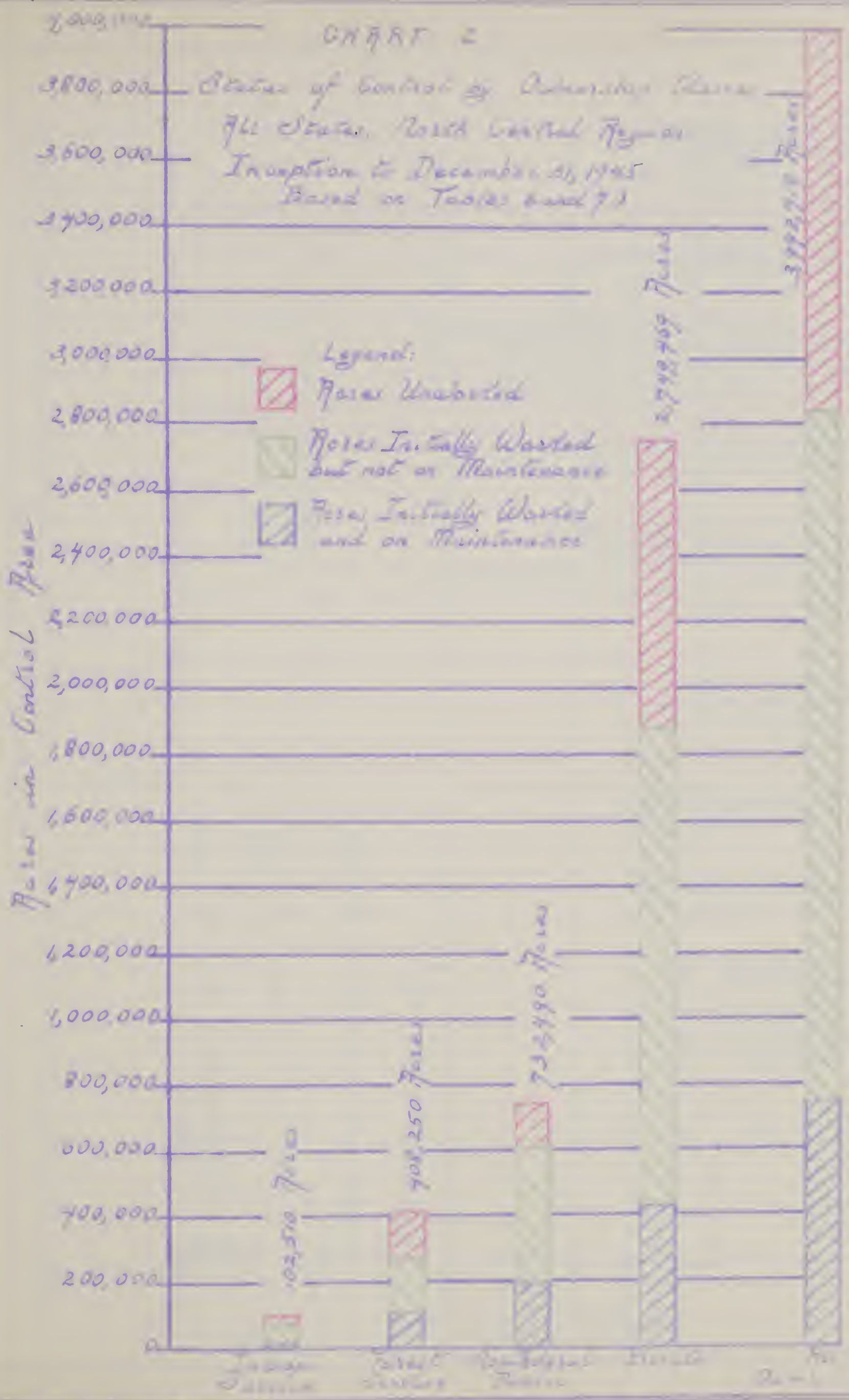
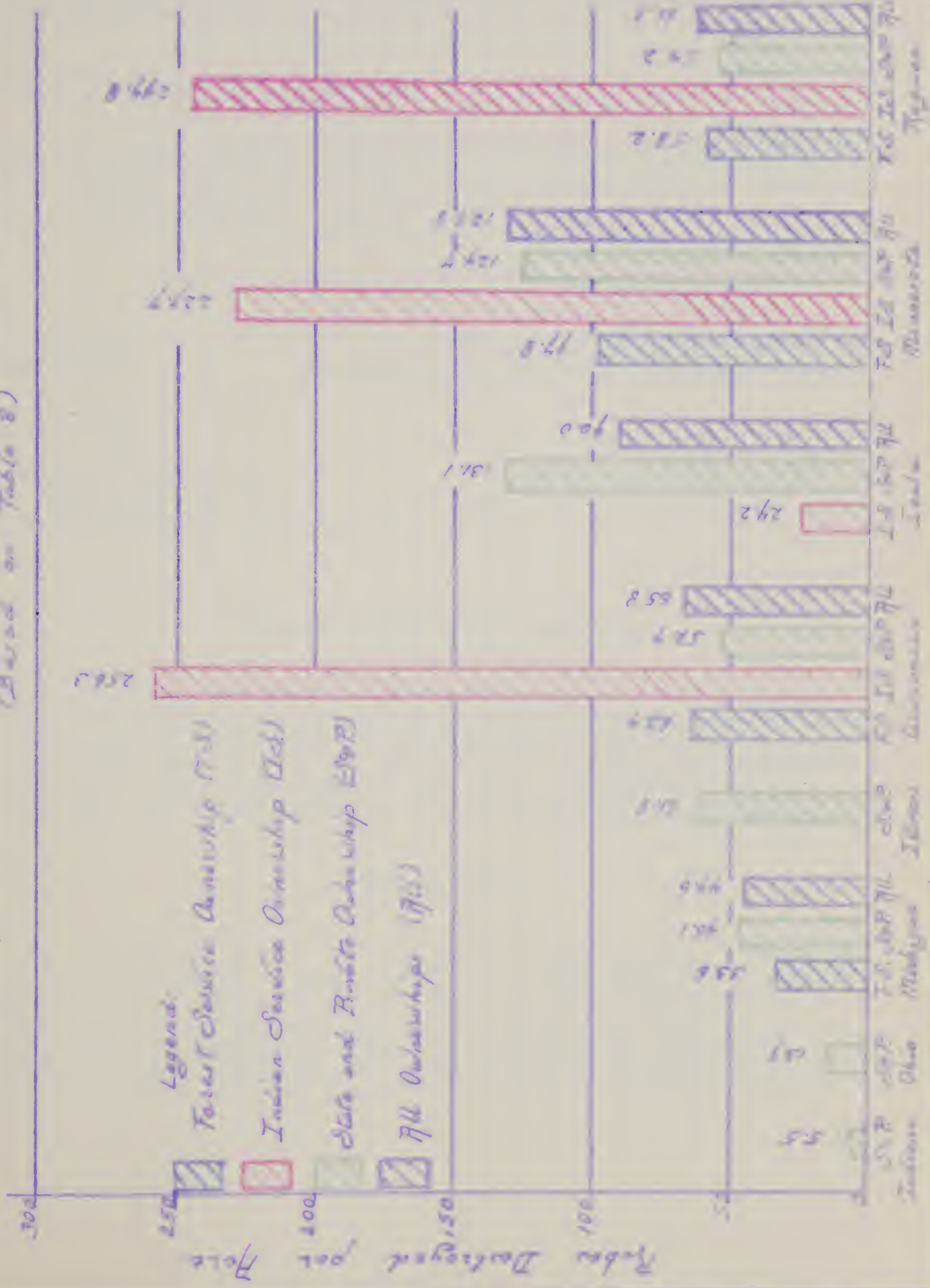


CHART 3

Rubber Destroyed per Tons by Status and Ownership Classes, Ft. Worth, Inception to December 31, 1945 - Road's Central Region
(Based on Table 8)



is shown in Table 5. During 1945, out of 1,075 shipments for potato shipping permits, 975 permits or 91 per cent were approved. Approximately 50 percent of the shipments were made in the spring, and 50 percent in the fall.

Violations of Federal Quarantine 65

As reported by the Division of Domestic Plant Quarantine, during the fiscal year 1945, there were 180 violations of Federal Quarantine 65, as rides shipped without permits going from the States of Michigan, Minnesota, Ohio, and Wisconsin, as shown in the following table. This is more than double the 79 violations reported in fiscal year 1944.

Violations of Federal Quarantine 65, Fiscal Year 1945

Station Where Intercepted	States of Destination				Total
	Michigan	Minnesota	Ohio	Wisconsin	
Buffalo, N. Y.	3	-	-	-	3
New York City, N. Y.	-	-	1	-	1
Chicago, Illinois	99	-	18	95	182
Pittsburg, Pennsylvania	-	-	1	-	1
St. Paul, Minnesota	-	15	-	2	15
Total	102	15	19	97	233

Cultivated Black Currant Elimination

As shown in Table 10, cultivated black currant elimination was performed in 1945 only in Iowa, where 15 bushes in 5 plantings were destroyed. To the end of 1945, for the Region as a whole, 228,521 cultivated black currant bushes in 34,770 plantings had been destroyed. There remain 973 known plantings with 5,674 cultivated black currant bushes not yet destroyed. Thus, 97.7 percent of all known bushes have been eliminated.

Canner Pruning

A limited amount of canner pruning in protected areas was performed in Iowa and Minnesota, as noted in Table 11. There were 9,648 canners removed to save 5,722 infested white canes. To date, 175,073 canners have been removed from 55,008 trees, and 1,708 infested canes have been cut down, chiefly in Michigan and Minnesota. It is believed that when adequate labor is again available, canner pruning in selected crop trees in a protected area can be economically justified, as a control measure.

Informational Activities

No blister rust control exhibits were shown in 1945. The eastern blister rust control film was shown at several points before school children and others. The Wisconsin Kodachrome film was shown at the Wisconsin Conservation Department School at Trout Lake. The State Entomologist and State Leader discussed the control problem in Wisconsin at that meeting.

Other talks throughout the Region were given. In Wisconsin a thirteen minute interview was recorded for broadcast between Russell E. Proet, State public relations official, and T. V. Louhe, State Leader on the subject "Protecting Wisconsin's White Pine from Blister Rust."

Correspondence in connection with issuing control area permits for shipping ribs continued to be an excellent way of acquainting ribs and pine owners with blister rust control.

During the late summer and fall Dr. Honey took many pictures in Minnesota, Wisconsin and Michigan. He attempted to obtain good pictures of white pine in all associations and age classes in the three States. Later in the fall he identified and classified prints and negatives in the Lansing, Michigan and Milwaukee offices. This was a job that needed doing. As additional official negatives are taken, they can be similarly classified, so that the system will continue useful by always being up-to-date.

Investigational Work

Canker Pruning

Experimental canker and silvicultural pruning was performed in a stand in the Cloquet Valley State Forest, north of Duluth, Minnesota, initially worked in 1944.

This stand includes 44 acres of white pine, in the 21 to 40 year age class. There are about 200 pole size white pine with a scattering of red pine, spruce and balsam fir per acre. If white pine is killed off by blister rust, there is little timber value left. Over 50 percent of the white pines were affected with blister rust.

Four one-acre plots were staked, making sure that all conditions were as alike as possible. Treatment was as follows:

(1) Plot 1. Crop trees pruned completely. Crop trees numbering about 175 per acre, visibly free from trunk cankers, well formed, and well distributed were selected and tagged. All side branches up to five last whorls were pruned close to trunk.

(2) Plot 2. Cankers only pruned from crop trees. Crop trees as described under Plot 1 were selected. However, only the branches with cankers were removed.

(2) Plot 3. All piney ground.

(4) Plot 4. Dead pine. One tree isolated and tagged since no work at this distribution and condition, probably regard to pest infestation.

Data in summary on this experiment, were carefully segregated into two: (1) pertaining to the setting up of the experiment and the surveying selection of crop trees, silviculture of cypress and (2) performing actual and/or silvicultural work. The latter cost figures are important in approximating the value of the work.

Results of the experiment to date are shown in the following table:

Experimental Center Project, Mississippi, Spring, 1944
Tree Planted by Average Height of 5.5 to 5.8 Feet

Plot Number and Description	Total White Pines	White Pines Planted	Number Cypress Planted	Average Number per Tree	Cost, Time per Acre	
					Seed	Time
Small Plot One Acre					Seed	Time
Plot 1. Isolated One Tree Planted on Last 5 Lave Plots	227	190	117	0.71	88	2-3/4
Plot 2. Cypress Only Planted Area One Tree	513	242	226	1.07	15	1-3/4
Plot 3. All Trees Planted	290	242	121	0.15	82	2-5/8
Total	1030	674	464			
Per Acre Average	277	222	164	0.76	17	2-3/8

The cost of silviculturally growing 190 crop trees per acre, including the removal of other unwanted branches, was 82 hours per acre. 9 hours more than the cost of putting out only cypress branches. It is still not clear to determine whether cypress growing destroyed all of the cypress in upper side branches, or in the trunk. Also the silviculturally growing may result in some injury from seed. If, however, growing work of two and three-quarter days per acre in a silviculturally protected pine stand where the difference between a well stocked sole stand of white pine, and one of scattered red pine, spruce, balsam white pine and cypress, such work should be truly profitable. That area will be carefully watched in the future.

Experimental Chemical Weed Eradication

In the 1944 chemical control the results of using 2,4-D, DDT, and 2,4-D and DDT together are shown. In general, good results in killing other species of the forest were obtained, with sufficient amounts of the dry chemicals were applied to the forest ground. This treatment was fairly successful even in winter.

During 1945 quite intensive experiments with 2,4-Dichlorophenoxyacetic acid (2,4-D) as a ribicide were made on various ribes species common in the region. This chemical in several commercial mixtures such as "Weedoloid," "Weedone" and "A-510" was used. The "A-510" put out by Dow Chemical Company, was quite consistently used. The following paper, written by Mr. Aronson, describes the experimental use of 2,4-D as a ribicide in Michigan. Results obtained in Wisconsin and Minnesota were similar to those in Michigan. In Illinois, *R. missouriense* was sprayed with 2,4-D, and found moderately susceptible, similarly to *R. cynosbati*.

"Experiments with 2,4-D on Various Species of Ribes in Michigan - 1945"

"By J. E. Kroeber, State Leader, Blister Rust Control"

"Object: To determine the effect of 2,4-Dichlorophenoxyacetic acid (2,4-D) on various ribes species found in Michigan with particular reference to its use as a ribicide in White Pine Blister Rust Control."

"Material Used: 'A-510,' a water soluble powder, 70% of which is 2,4-Dichlorophenoxyacetic acid. Used in varying strengths ranging from 1 to 4 tablespoons per gallon of water."

"G-510" and "G-522," esters of 2,4-D mixed in kerosene at the rate of 1:9.

"G-536," an oil emulsion containing an ester of 2,4-D, mixed in water at the rate of 1:30.

"Species Treated: *R. americanum*, *R. cynosbati*, *R. hirtellus*, *R. glandulosum*, and *R. triste*."

"Methods and Procedure"

"Several hundred ribes plants were sprayed with the above solutions from an ordinary garden variety 3-1/2 gallon capacity pressure sprayer equipped with a nozzle that produced a fan-shaped, flat, mist-like spray. The spray was applied to individual wild current and gooseberry bushes when they were in leaf."

"Dates of application ranged from May 26, to September 21, 1945."

"The locations of the experiments were at two widely separated places in Michigan, one near the Village of Wolverine in Cheboygan County and the other near the City of Escanaba in Delta County. Inspection of the treated plants were made from two to four weeks after treatment and were continued until early fall."

"As a matter of interest two other methods of applying A-510 to ribes were tried - drenching and dusting."

A solution of one part in 50 of water was applied to the leaves of R. americanum, R. cynosbati, R. hirtellum, R. glandulosum, and R. triste on August 30, 1945, and the plants were inspected on September 19, 1945. In the case of other 2,4-D preparations, only R. americanum seemed to be killed.

It was noted that even in the case of R. americanum, that in order to apparently kill the plant it was important to spray the entire bush. Care had to be taken to treat branches which lay along the ground and were hidden by grass. When such branches were missed it was noted that they remained healthy even though the upright portion of the bush appeared to have succumbed.

Tentative Conclusions

While definite conclusions about the effects of 2,4-D on ribes cannot be arrived at until observations are made in the succeeding growing season, certain tentative conclusions can be drawn.

- "1. 2,4-D, when sprayed on the entire plant apparently kills R. americanum.
- "2. Other species of ribes are affected to a certain degree but are not killed; the wild gooseberries are adversely affected while skunk and red currants are not affected in the least.
- "3. Mixtures of 2,4-D and kerosene or fuel oil are apt to appear more spectacular in their immediate effect on ribes but new leaves and sprouts will appear. Apparently the oil burns the foliage before the chemical is absorbed by the plant.
- "4. Water solutions of 2,4-D seem to be most satisfactory.
- "5. Increases in strength of solution seems to have little effect. If the plant can be killed with 2,4-D at all the manufacturer's recommendation as to strength will prove just as effective as stronger doses. A solution of 1-1/4 pounds 4-51D in 100 gallons of water seems to be strong enough to kill the native wild black currant. Solutions ten times as strong sprayed on the leaves did not kill the other species of ribes.
- "6. Better results can be expected early in the growing season than later on, for two reasons. In the first place, the foliage is more tender in the spring. Secondly, ribes can be more readily found and treated early in the season because of less obstruction from associate plants. However, in the case of R. americanum it appears that its destruction can be accomplished any time the plant is in leaf.
- "7. Chemical eradication of ribes will not displace hand eradication methods until a chemical is found that will kill all species of ribes and accomplish their eradication more economically than the present method of uprooting them.

- *9. Apparently need not be the principal objective of a system - but should aim to kill all vines and prevent their reproduction. Selection can be accomplished by the use of spraying only vines.
- *9. Breaking the soil around the roots of vines plants with a water solution of 2,4-D seems to kill vine vines that are not affected by ordinary spraying of the foliage. This however, is a limited observation as only five plants were examined - four being red currants (R. toxica) and one gooseberry (R. spicata).
- *10. Treating the foliage of vines with a mixture of A-510 and hydrated lime produced about the same effect as water solutions - apparently killing R. toxica but having no effect on the other species.

In cooperation with the Forest Service Region 9 Timber Management Office an experiment was conducted to determine the effectiveness of 2,4-D in killing competing brush including vines, in coniferous plantations. Dow Chemical Company A-510, 70 percent of which is 2,4-D, was used in various concentrations and with and without stickers. The sprays were applied by means of the garden type compressed air sprayer. Spraying was done on replications of the plots early in June, and early in August.

Results were disappointing. No effective release of seedlings was accomplished. The spray caused a temporary retardation of growth of terminals of white pine and red pine.

Ammonium sulfamate (amate) was tried on three species at the rate of one pound of amate to one gallon of water. In all cases the vines were defoliated, but produced an additional crop of leaves.

In summary, the results of experimental chemical eradication in this Region are as follows:

1. Ammonium sulfamate - 1 pound to one gallon water.

Effect on all three species is to defoliate them, and not kill the stems. A second crop of leaves is often produced, and, in some cases, sprouting seems to be stimulated.

2. 2,4-D, various strengths.

Plants treated may be classified as follows:

- a. Highly susceptible - R. americana.
- b. Moderately susceptible - R. spicata, R. vitellina and R. discolorata.
- c. Insistent - R. glaberrima and R. lutea.

Technical Memoranda

Two Technical Memoranda, Nos. 6 and 7, were prepared in the Milwaukee office during 1945. The name and summary of each is shown following.

Technical Memorandum No. 6, Summary of U.S.D.A. Bulletin No. 16
"Forestry Conditions and Interests of Wisconsin"
by Filibert Roth, 1898

"In 1897 the Wisconsin Legislature authorized the appointment of the Governor of a Commission to formulate desirable forestry legislation for the State. To obtain the factual basis for action of such a commission, Mr. Filibert Roth was detailed for three months to Wisconsin. His salary was paid by the U. S. Department of Agriculture; \$500 was made available for his expenses by the Wisconsin State Geological Survey; and the railroads supplied Mr. Roth with free passes.

"Mr. Roth's findings and conclusions are presented in an interesting and complete fashion in 'Forestry Conditions and Interests of Wisconsin' Bulletin No. 16, U.S.D.A., Division of Forestry, published in 1898. The Bulletin covers 76 pages. It includes a foreword of 14 pages by S. E. Petrone, then Chief, Division of Forestry.

"The territory studied by Mr. Roth included the 27 counties lying north of a line running approximately west across the State from Green Bay. In obtaining his data Mr. Roth contacted a large number of practical woodmen, traveled over practically every mile of railroad in the area, and 'several hundred miles' by horse and wagon, and 'no county received less than two days' attention.'

"Mr. Roth's report is of great interest, not only because it presents in remarkably clear detail forest conditions as of 1895 in Wisconsin, but especially it is valuable in relation to present day conditions. His estimates of standing white pine in 1897 are quite accurate when compared with figures showing total cut from 1898 to 1942 added to estimated standing timber in 1942. His warnings concerning the need for fire control, non-wasteful logging, and encouragement of young stands through natural reproduction and planting sound very modern."

Technical Memorandum No. 7, Ribes Regeneration After Excavation
in a Young, Degraded Hardwood Type in Northern Wisconsin

Conclusion

"Studies of ribes conditions in an degraded, young hardwood stand in northern Wisconsin before working, and for six years thereafter, indicate that while ribes bushes persist as seedlings and original bushes after working, the

Results were remarkable. There was freedom from insects around camp. The camp disbanded on July 19. The fly trap, from June 28, 1945 to July 19, 1945 succeeded in trapping only 3 flies and 1 bee. This sample was not saved.

Vermilion Trail Camp

This was an abandoned portable sawmill camp, with frame and bar paper buildings, typical of such camps. Previous to the big job of cleaning it up and making it habitable it had a well deserved reputation as a home for bed-bugs. The camp was rather low, close to a swamp, and a large pile of old sawdust.

After a thorough cleanup, by scrubbing and lysol water, the buildings were completely covered inside and out on June 9, 1945 with 10 gallons of DDT. On July 9, 1945, 7 additional gallons of DDT were applied.

Bedbugs disappeared after spraying. Some flies and mosquitoes were present after the initial spraying, but disappeared after the July 9 treatment. No fly trap was installed at this camp.

Gumflint Camp

This is a former C.C.C. camp in good condition. No spraying with DDT was performed here, since this was used as an untreated check. Insect pests were not too bad, because they were unusually light in 1945 in this general locality. For this reason the test was not so effective as it would be in years of normal insect abundance. A fly trap, set from July 9 to August 31, 1945, and baited with fish heads caught 13 kinds of insects, which were sent to Dr. Parman, Dvalde, Texas.

Insect Repellent Tests

A relatively large scale test of a new insect repellent, 2-Phenyl-cyclohexanol, was made throughout the Region in 1945. This turned out to be a poor year for the test, because insect pests affecting man were much less in evidence than usual, possibly because of the early spring and severe frosts in June.

The 2-Phenyl-cyclohexanol was received in a 5-gallon container. It was supposed to be fluid and to be packaged in two-ounce bottles. Unfortunately, however, it had the consistency of sludge and no amount of stirring or heating made it liquid. Following the advice of the Dow Chemical Company, and suggestions from Mr. Dillard, we made a solution by weight of 30 percent Iso-propyl alcohol and 70 percent 2-Phenyl-cyclohexanol. This made a clear, water-color solution, somewhat oily.

This solution in two ounce bottles was sent to the field for trying out as an insect repellent in comparison with "Rhat", similarly packaged.

Forms furnished by the Division of Insects Affecting Man and Animals were filled out and returned to show results of tests using the two repellents.

COOPERATIVE ACTION AND CONTROL ON STATE AND PRIVATE LANDS IN THE

SOUTHERN REGION, 1945. (See Project 514-3-1)

Objective of Cooperative Project

The purpose of this cooperative project is to control white pine blister rust on all non-federal lands, both public and private. Non-Federal Public and Private lands are matched by Regular Federal funds insofar as appropriations are available. These funds are administered cooperatively by the Bureau of Entomology and Plant Quarantine and State agencies concerned and are spent entirely for local control on state and private lands.

Cooperative Expenditures in 1945

During 1945, as noted in Text Table 1, \$26,505.87 were spent as direct aid by state and private cooperators, including states, counties, municipalities and individuals, on the protection of state and privately-owned white pine against blister rust. Matching these funds the Bureau of Entomology and Plant Quarantine spent a total of \$65,175.91 of 5103 funds. Thus, a total of \$91,681.78 was spent on local control on state and private lands in this Region. In 1946 there was an increase of more than \$11,000 of state direct aid, and \$31,000 of 5103 funds, or more than \$42,000 over such funds in 1945.

Control Accomplishment, 1945

In Text Table 1 local control accomplished on most Regular-Cooperative funds on state and private lands is shown. It will be noted that under all workings 17,567 acres of white pine were given protection by the removal of 1,343,625 trees from 127,994 acres of worked area at a cost of 11,140 man-days. This is a substantial increase of work done over that of 1944.

Only those areas were selected for working according to white pine blister rust of the greatest value and in most immediate need of protection, irrespective of whether the work was initial or reworking.

The Bureau of Entomology and Plant Quarantine used its funds primarily for labor. State and Cooperative funds were used in the employment of labor, supervisors, the assignment of state and county men to control work, the employment of owners of white pine, etc. To a greater or lesser degree, owners contributed toward the protection of their own stands in all of the states. Examples of other types of cooperation on the part of states may be given.

In Wisconsin, several counties used County Forest Day Law funds for the employment of rangers and other personnel in county forests. In Wisconsin, a camp was established, made up of high school boys employed on 1000 acres and State employees for rangers and other personnel in the County Forest Day Law funds. In Iowa, men were employed on State Conservation funds for local control on state lands.

Status of Control

In order that a complete record may be available for all work done under the Regular-Cooperative program, Table 5 has been devised to show all work since inception in 1942 through 1945.

The status of control on state and private lands in this region as of December 31, 1945, is shown in Table 5 and graphically in Chart 1. The total control problem includes 3,481,869 acres, approximately four-fifths of which is owned privately-owned white pine. This represents an increase of 9,762 acres of white pine, and 2,873 acres of control area over corresponding figures at the end of 1944. These increases were largely due to newly planted white pine.

Of the total control area, over 71 percent had been initially worked, and nearly 15 percent was in maintenance. Thus, while progress has been made in the protection of state and privately-owned white pine, there remains a great amount of work to be done before all control work is accomplished, and such stands are in a state of maintenance.

Text Table 1. Summary of Insect Control on State and Private Lands,
North Central Region, 1945, Bureau-State Funds, BLP-3

State	Ownership Class	Acre White Fly Protected		Acre Worked	Bites Destroyed	In- Days Dead
		Federal	Private			
Initial Working						
Illinois	Non-Fed. Public	-	3	3	181	992
	Private	-	25	29	2,475	-
Iowa	Non-Fed. Public	26	42	70	607	76,076
	Private	10	7	17	154	17,923
Michigan	Non-Fed. Public	552	96	648	1,251	14,616
	Private	1,986	197	2,083	6,785	165,480
Minnesota	Non-Fed. Public	-	-	-	-	-
	Private	-	-	-	-	-
Wisconsin	Non-Fed. Public	507	909	1,416	2,004	72,159
	Private	23,627	1,62	24,079	59,589	122,101
Region	Non-Fed. Public	1,571	552	2,523	3,433	295,370
	Private	25,513	701	26,214	69,003	305,504
Total		27,084	1,253	28,337	72,436	600,874
Second Working						
Illinois	Private	-	1	1	102	99,501
	Non-Fed. Public	15	3	18	142	25
Iowa	Private	10	7	17	531	24,413
	Non-Fed. Public	-	-	-	-	-
Michigan	Non-Fed. Public	1,892	230	2,122	4,555	111,385
	Private	6,103	109	6,212	20,142	213,116
Wisconsin	Non-Fed. Public	3,715	325	4,040	9,580	70,727
	Private	3,046	77	3,123	10,151	126,335
Region	Non-Fed. Public	5,607	729	6,336	14,235	1,507
	Private	11,487	310	11,797	31,790	567,940
Total		18,750	1,036	19,786	46,076	746,668

[Cont'd.]

Text Table B. Cumulative Summary of Local Control on State and Private Land,
North Central Region, 1962-1965, Bureau-State Funds, BLS-1

State	Ownership Class	Local Native Pine Protected			Acre Worked	Pines Destroyed	Days Worked
		Natural	Planted	Total			
		Initial Working					
Illinois	Non-Fed. Public	-	14	14	560	2,843	90
	Private	-	321	321	6,074	112,360	62
	Total	-	335	335	6,634	115,203	152
Indiana	Non-Fed. Public	-	9	9	734	2,802	30
	Private	-	528	528	7,175	42,419	277
	Total	-	537	537	7,909	45,221	307
Iowa	Non-Fed. Public	60	70	130	1,003	117,457	90
	Private	10	91	101	1,082	39,029	57
	Total	70	161	231	2,085	156,486	147
Michigan	Non-Fed. Public	2,573	1,611	4,184	17,672	119,335	480
	Private	11,868	2,783	14,651	60,303	534,045	1,140
	Total	14,441	4,394	18,835	77,975	653,380	1,620
Minnesota	Non-Fed. Public	1,413	30	1,443	2,373	212,298	1,707
	Private	-	2	2	33	2,000	1
	Total	1,413	32	1,445	2,406	214,298	1,708
Ohio	Non-Fed. Public	-	823	823	3,100	17,027	150
	Private	197	1,745	1,942	13,623	27,399	302
	Total	197	2,568	2,765	16,723	44,426	452
Wisconsin	Non-Fed. Public	5,129	4,109	9,238	22,338	265,404	1,735
	Private	39,421	1,407	40,828	102,956	512,713	3,070
	Total	44,550	5,516	50,066	125,294	778,117	4,805
Region	Non-Fed. Public	9,175	6,856	16,031	47,823	674,986	3,005
	Private	51,486	6,877	58,363	191,246	1,319,885	7,470
	Total	60,661	13,733	74,394	239,069	2,004,871	10,475

(Cont'd)

Table 2. (Cont'd) Cumulative Summary of Land Worked on State and Private Lands, North Central Region, 1942-1945, Bureau-State Funds, RLB-3

State	Ownership Class	Land Area Planted			Acres Worked	Ribes Destroyed	Value Paid
		Natural	Planted	Total			
All Workings							
Illinois	Non-Fed. Public	192	1,053	1,245	5,843	180,078	1.85
	Private	55	1,040	1,095	9,833	182,530	1.11
Total							
Indiana	Non-Fed. Public	-	572	572	2,804	13,969	1.64
	Private	-	528	528	7,175	12,119	2.7
Total							
Iowa	Non-Fed. Public	520	93	613	2,102	259,304	2.11
	Private	20	250	270	2,192	71,193	2.4
Total							
Michigan	Non-Fed. Public	14,602	4,534	19,136	45,673	364,903	1.35
	Private	28,288	5,934	34,222	109,970	1,082,882	6.51
Total							
Minnesota	Non-Fed. Public	2,752	273	3,025	4,944	321,769	4.23
	Private	-	72	72	155	9,055	.07
Total							
Ohio	Non-Fed. Public	-	1,375	1,375	5,677	17,023	1.37
	Private	127	1,846	1,973	14,421	27,940	.67
Total							
Wisconsin	Non-Fed. Public	19,482	7,016	26,498	57,327	120,647	3.91
	Private	63,004	2,078	65,082	181,557	823,255	1.21
Total							
Region	Non-Fed. Public	55,436	14,885	70,321	125,370	1,815,114	14.17
	Private	95,472	9,748	105,220	325,303	2,210,074	16.64
Totals							
Totals		150,908	24,633	175,541	450,673	4,025,188	28.81

Notes: In Table 2, work done by Bureau-State funds on State and Private lands for period 1942-1945 only is shown. For total work done from 1917 to 1945 on State and Private lands see Table C.

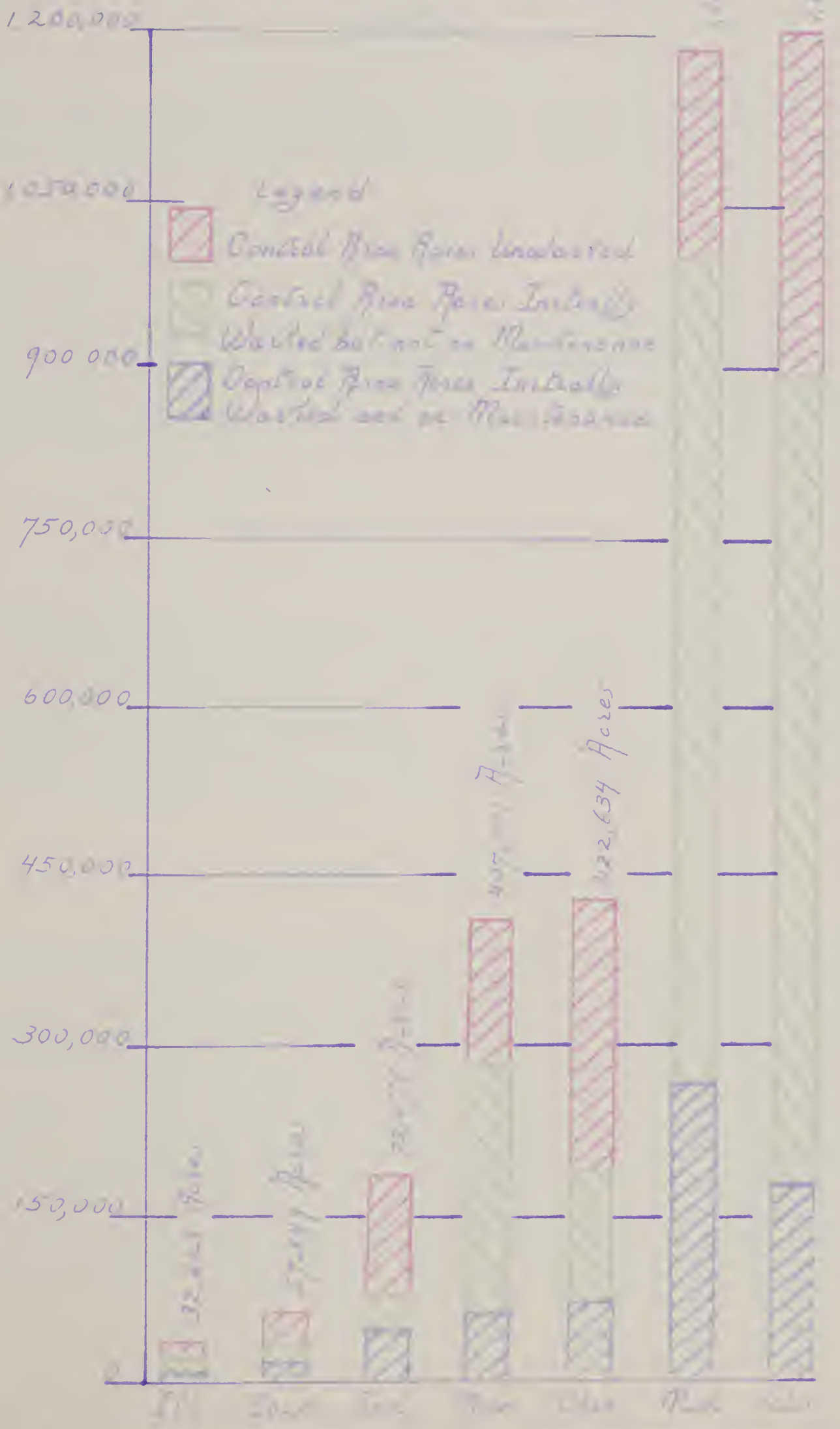
Text Table 4. Costs of Control on State and Private Lands, RLB-3,
North Central Region, 1941 to 1945

State	Period of Time	State and Private Cooperation Direct Aid	Bureau Cooperation 5103	Grand Total
Illinois	1941-1944	\$13,999.04	\$9,671.68	\$23,670.72
	1945	5,893.68	3,018.54	8,912.22
	1941-1945	19,892.72	12,690.22	32,582.94
Indiana	1941-1944	1,363.12	885.74	2,248.86
	1945	-	-	-
	1941-1945	1,363.12	885.74	2,248.86
Iowa	1941-1944	8,559.85	5,951.25	12,511.10
	1945	5,324.89	6,166.12	11,491.01
	1941-1945	13,884.74	12,117.37	25,999.11
Michigan	1941-1944	21,665.10	20,289.87	41,954.97
	1945	9,939.63	19,670.17	29,609.80
	1941-1945	31,604.73	39,960.04	71,564.77
Minnesota	1941-1944	12,033.87	11,766.75	23,800.62
	1945	10,017.47	16,601.18	26,618.65
	1941-1945	22,051.34	28,367.93	50,419.27
Missouri	1941-1944	3,909.64	4,198.26	8,107.90
	1945	-	574.34	574.34
	1941-1945	3,909.64	4,772.60	8,682.24
Wisconsin	1941-1944	25,346.43	26,240.75	51,587.18
	1945	15,727.80	17,445.26	32,173.06
	1941-1945	41,074.23	43,686.01	84,760.24
Region	1941-1944	84,774.20	78,784.50	163,558.70
	1945	46,302.85	63,175.91	109,478.76
Region Total	1941-1945	131,077.05	141,960.41	273,037.46

CHART 4

Area of Interest for 2015
and 2016 Land Use Change
North Central Region
To December 31, 1995
(Based on Table 3)

Acres in Control Area



BLISTER RUST CONTROL ON NATIONAL FORESTS.
WAPSI CENTRAL REGION, 1945, PROJECT BLR-4

Foreword

No outline forest maps accompany this report. There were insufficient changes in status in 1944 and 1945 to justify the preparation of new maps. The reader is referred to maps with the 1943 Report.

Objective

The objective of the Blister Rust Control Program on National Forests is to protect against blister rust all valuable white pine stands under Forest Service ownership. This involves initial and subsequent ribes eradication within infesting distances of white pine stands in order to bring such stands through to commercial maturity free from blister rust damage.

Memorandum of Understanding

Control work on National Forest lands is performed through a written Memorandum of Understanding between the Forest Service and the Bureau of Entomology and Plant Quarantine. The Forest Service is responsible for selection of pine areas to be protected, employment of labor and supervision and operations of camp. The Bureau is responsible for the preparing of work plans and maps, keeping records, making reports, training of labor and supervision, and checking the adequacy of the control work.

Protection Zone Widths

Blister rust control involves the removal of ribes bushes within a pine stand and for a sufficient distance around it to assure protection. Formerly, this protection zone width was 900 feet. Within recent years this width has been reduced materially depending on forest types concerned. In live swamps of alder, cedar, etc. the zone width has been reduced to approximately 50 feet, or one tree width. Studies have failed to show serious damage to pines from swamp ribes, except for short distances. Ribes eradication in swamps is expensive. Due to perpetual moist conditions and ability of ribes to regenerate by layering, it is almost impossible to permanently eradicate ribes in swamps. For these reasons, it is wiser to accept a small loss, if any, among pines bordering the swamps in preference to the relatively high cost of swamp ribes removal. The eradication of ribes in swamp borders removes those most dangerous to the pines.

The situation with respect to spread of blight rust on the Forest remained practically unchanged in 1945. Rust on pines was again reported as quite generally distributed. Previously, pine infection had been found at two points near the Halfway Ranger Station and at three points well spaced to the southwest corner of the Forest.

Only a small amount of work is recommended for 1946. No initial work is needed except around any white pine plantations which may be established in 1946. Through an excellent working arrangement between the Forest Supervisor and the Blight Rust Control District (owner), the latter estimates preventive white pine planting sites prior to planting in order to encourage the planting of white pine on sites where rives are not abundant.

Burns National Forest - Michigan

The present control problem consists of 368 acres of natural pine, 1,830 acres of planted pine, within a total control area of 6,577 acres. All this has been initially worked, and 63 percent of it is on maintenance. No rive eradication was performed in 1945.

Rust conditions remained the same as in 1944. Rust on pines was generally distributed but known pine infections are limited to a few trees each near Mio, Lincoln, and East Tawas.

Very little control work is recommended for 1946, other than the spacing of areas to be planted to white pine. The same excellent working agreement described for the Ingham is in effect on the Burns.

Marquette National Forest - Michigan

No rive eradication was performed on the forest in 1945 as the status of control remains the same as at the end of 1944. About equal acreage of planted and natural white pine have on the 10,766 acres listed for protection. There remain approximately 517 acres of natural pine to be initially protected. About 37 percent of the pine acreage, chiefly in the northern third of the forest, is on a maintenance basis.

Rust on pines is generally prevalent on the forest. Pine infection has been found at three localities: south of Moran, northwest of Rudyard, and southwest of Iron. While additional pine infections were found in 1944 there was no increase in the known range of the rust on the forest.

Work remaining to be done involves the initial protection of 517 acres of white pine requiring the removal of rives from 1,970 acres of control area, and several acres needed. A listing of all areas by Ranger Districts, in order of priority of need, has been made.

Hiawatha National Forest - Michigan

Pine eradication work was performed on this forest in 1945, using high school boys working out of Camp Douglas, a government subsidized camp, and former C-O-D. buildings. To protect initially 749 acres of pine, 25,000

- (8) In the selection of areas for working, great care must be exercised to make sure that only those areas are worked in which the young pine values are the greatest and in most immediate danger of damage from blister rust.

In view of the large amount of work yet to be done in accomplishing control work, of the rapidity with which the rust is intensifying, it is inevitable that millions of young pines on thousands of acres will be killed by blister rust. This means a loss of many existing white pine stands. On thousands of acres of such areas white pine is the best crop. In the post-war period or when labor becomes available the removal of ribes from such areas should be performed to permit future or continued development of white pine forests.

Table 5: (Cont'd) Local Control of National Forest Lands, by National Forest and Operating Agency, North Central Region, 1945

National Forest	Operating Agency	No. Acres	Acres under Pine Protection		Acres Controlled	Pines Destroyed	Bureau Year
			National	Local			
Bald and Other Workings							
Elevette, Mich.	Forest Service	2	500	-	1,050	1,050	1945
	Forest Service	4	300	-	785	4,279	1945
	Bureau-State	2	210	-	305	9,969	1945
	Sub-total						
Chippewa, Minn.	Forest Service	1	-	67	75	3,974	1945
	Forest Service	1	308	260	281	3,481	1945
	Forest Service	8	1,116	301	2,404	54,149	1945
	Bureau-State	2	240	-	305	9,959	1945
Sub-total							
Sub-total for Great Westings		10	1,358	61	3,457	64,111	1945
All Workings							
Bureau, Ill.	Bureau-State	1	-	1	50	27,153	1945
	Forest Service	30	2,250	10	2,001	85,677	1945
	Forest Service	9	1,005	531	2,495	36,000	1945
	Bureau-State	7	905	-	1,455	1,131	1945
Sub-total							
Chippewa, Minn.	Forest Service	12	127	120	607	50,285	1945
	Forest Service	9	657	99	1,077	251,325	1945
	Forest Service	1	60	-	63	10,287	1945
	Bureau-State	10	917	33	1,150	1,131	1945
Sub-total							
Chequamegon, Wis.	Forest Service	1	571	127	1,006	17,132	1945
	Forest Service	1	332	101	1,006	28,136	1945
	Forest Service	10	5,226	2,050	15,631	586,927	1945
	Bureau-State	9	965	1	1,588	46,331	1945
Sub-total							
Sub-total for Great Westings		79	8,191	2,051	17,215	633,859	1945
Sub-total for Great Westings							

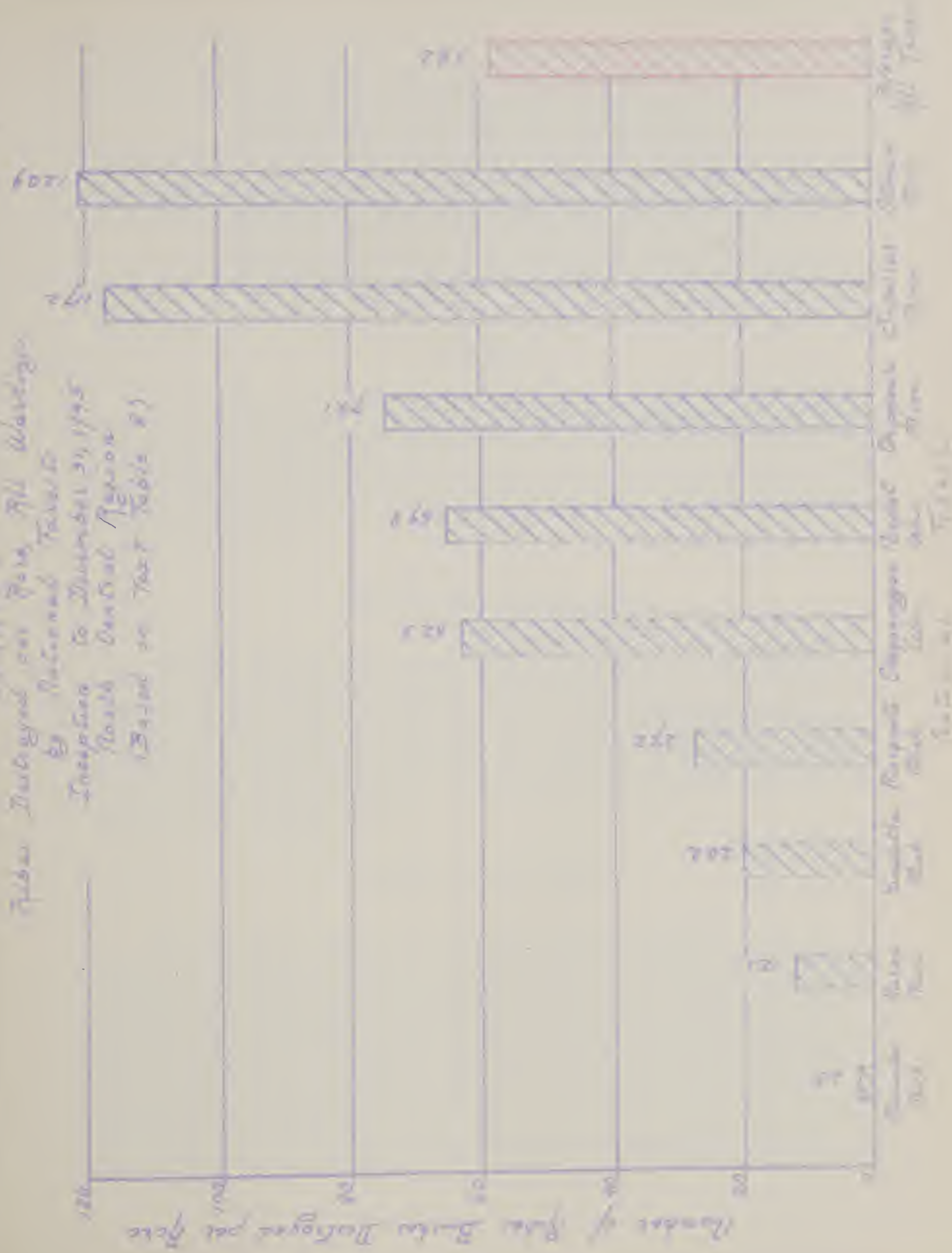
Text Table 7. Status of Control on National Foreests, North Central Region,
on December 31, 1945. Not Acre

National Forest	Total Control Problem, Acres				Acres Initially Worked				Acres Not Initially Worked		Acres Not Maintained	
	Natural Planted		Total		Natural		Planted		White Control		White Control	
	N. P.	P. P.	N. P.	P. P.	N. P.	P. P.	N. P.	P. P.	Plus	Area	Plus	Area
Shannon, Ill.	-	1	1	50	-	1	1	50	-	-	1	5
Shawnee, Ind.	-	70	70	391	-	-	-	-	70	391	-	-
Barren, Mich.	362	1,230	1,592	6,577	362	1,230	1,592	6,577	-	-	904	4,16
Manistee, Mich.	1,209	20,083	21,292	67,040	1,209	20,083	21,292	67,040	-	-	16,904	20,224
Marquette, Mich.	5,626	5,149	10,775	24,952	5,109	5,149	10,249	23,042	517	1,910	3,944	5,300
Manistowish, Mich.	5,585	2,561	7,926	22,919	5,210	2,561	7,771	22,231	155	688	3,069	10,301
Chippewa, Mich.	7,814	4,312	12,126	24,219	6,992	4,142	10,733	19,160	1,391	5,099	876	1,770
Chippewa, Minn.	19,113	4,442	22,935	47,108	13,140	3,970	17,110	35,325	3,445	11,771	10,418	20,801
Elmendorf, Minn.	81,543	4,801	35,304	144,308	20,743	4,801	25,544	57,277	60,850	107,051	1,842	1,900
Iskane, Ohio	-	920	920	4,341	-	920	200	1,875	920	2,466	200	1,377
Quincy, Wis.	11,776	4,732	16,508	41,865	11,511	4,380	15,891	37,644	617	3,621	1,681	3,800
Woolleb, Wis.	5,244	6,617	11,861	25,062	4,776	6,617	11,393	23,784	466	1,278	1,044	2,200
Grand Total	157,178	50,000	166,000	405,990	68,501	59,100	127,601	372,319	70,003	136,203	40,472	103,170

Page Table 3. (Cont'd) Summary of local control performed on National Forests, North Central Region, from inception to December 31, 1945, all agencies Gross Acres

National Forest	Gross Acres N. P. Protected	Gross Acres Worked	Index of Blows Destroyed	Total 8-Hour Man-Days	Average per Acre Worked	
					Blows	Days
<u>Third and Other Workings</u>						
Marquette, Mich.	150	490	177	19	0.4	0.04
Manistee, Mich.	535	1,460	7,404	108	5.1	0.07
Ottawa, Mich.	838	1,090	52,248	444	47.9	0.44
Chippewa, Minn.	514	1,019	19,463	80	19.1	0.06
Superior, Minn.	3,229	6,540	207,354	1,613	31.7	0.25
Chequamegon, Wis.	1,037	1,270	26,591	573	20.9	0.15
Total District and State Workings	6,603	11,666	313,237	2,807	25.4	0.21
<u>All Workings</u>						
Shawnee, Ill.	1	50	0	0	0.0	0.00
Euron, Mich.	1,734	7,127	87,930	646	12.3	0.09
Manistee, Mich.	24,129	76,349	164,610	1,639	2.3	0.02
Marquette, Minn.	14,934	33,809	918,780	8,838	27.2	0.26
Manistee, Mich.	13,196	37,142	749,080	6,494	20.2	0.17
Ottawa, Mich.	19,453	37,835	4,576,044	19,473	120.4	0.92
Chippewa, Minn.	21,767	49,869	3,694,212	16,368	74.1	0.33
Superior, Minn.	37,437	61,005	7,143,210	33,617	117.2	0.33
Wayne, Ohio	200	1,875	55	13	Trace	0.01
Chequamegon, Wis.	20,692	47,892	2,902,475	19,759	62.3	0.41
Piscataway, Wis.	17,811	98,861	2,521,356	17,228	64.8	0.44
Total All Workings	67,970	371,682	21,071,787	123,872	34.2	0.28

CHART 6
 Trucks Destroyed per Type, All Warships
 by National Forces
 Inception to December 31, 1945
 North Central Region
 (Based on Text Table 2)



BLISTER RUST CONTROL ON INDIAN RESERVATIONS,
WHITE PINE NATIONAL FOREST, PROJECT 355-7

NOTE: Outline maps of individual Indian Reservations showing status of control are not included with this year's report because changes in status were not deemed sufficiently large to warrant presentation of any maps. The reader is referred to such maps in the 1953 Report.

Objective

The objective of the blister rust control program on Indian Reservations is to protect against blister rust all valuable white pine stands administered by the Indian Service. This involves removal and subsequent eradication of vines from within infested stands of white pine stands in order to bring such stands through to commercial maturity free from blister rust damage.

Summary of Understanding

Control work on Indian Reservation lands is performed through a program of understanding between the U. S. Indian Service and the Bureau of Entomology and Plant Quarantine. The Indian Service is responsible for selecting the pine areas to be protected and the employment of labor and supervision. The Bureau of Entomology and Plant Quarantine is responsible for the propagation of virus plants and eggs, removal of vines, making proper use of work equipment, training of labor and supervision, and making the necessary arrangements for the control work.

Protective Zone Width

The control of white pine blister rust involves the removal of current and possibly future, the alternate hosts, from within the pine stand and from the immediate surrounding area. In this report, current and possibly future will be referred to as "vines." Under various conditions it has been found that it is not necessary under certain conditions to maintain a full 300-foot protective zone width. During recent years, studies have indicated that it is not necessary under certain conditions to maintain a full 300-foot protective zone width. In the case of removal of vines, some vines may be removed by means of a brush or by cutting them out with a chainsaw. The protective zone width may be reduced to approximately 50 feet in some cases. In some cases, 500 feet is used, but usually the full 300-foot

in some light or shadow types. The screening effect of dense young growth hinders the dissemination of spores from infected trees in the swamp to the pines in the upland. The movement of spores from swamps is further hindered by the fact that most swamps are heavily shaded and cool, therefore, preventing the formation of rising air currents.

By reducing these zone widths the cost of eradication is considerably lessened. Ordinarily, one acre width along the edge of a swamp will be adequate to prevent heavy infection of the adjoining pine stand. These reductions in zone widths may not give complete protection but will provide sufficient protection to bring a fully-stocked stand of pine through to commercial maturity.

Rust Conditions

General Status for 1945

Abundant rainfall and prolonged periods of high humidity were again evident in 1945. These conditions are conducive to the spread of blister rust since they offer optimum conditions for the development of the disease. These favorable conditions have been prevalent since 1937. Blister rust has spread and rapidly intensified, particularly in the northern portions of the three Lake States.

Blister rust has been found on white pine and on ribes in all of the reservations except the Sac-Fox in Iowa and Lac du Flambeau in Wisconsin. The earliest infection on Indian Reservations was found on the Sisseton in 1916. Fortunately, ribes eradication was started in time and has continued on a sufficiently adequate basis to save large areas of white pine on all the Indian Reservations from excessive loss due to blister rust.

Significance of Present Rust Conditions

In order to better understand the significance of a small amount of pine infection in an unprotected stand, it is well to discuss briefly the development of infection. Three periods of development are recognized as follows: (1) Introductory Period; (2) Period of Intensification; and (3) Period of Climax.

(1) Introductory Period. This includes the period from initial pine infection to the time when approximately five percent of the pines are infected. It is characterized by relatively slow intensification of pine infection, with increasing numbers of pines becoming infected at three or four year intervals. Negligible damage except on very small pine is apparent. Depending on ribes conditions and other factors this period usually lasts from four to ten years.

(2) Period of Intensification: This is the period of the greatest number of cankers produced and of pines becoming infected. The percent of

pine killed increased from about five percent to the approximate minimum of 40 to 95 percent. Rates of infection usually occur every year periodically, in advanced stages. Death of pine increases most rapidly in the youngest and oldest and more slowly among the larger trees. This period varies from 5 to 15 years depending on volume of fire, site, exposure, geographical and weather conditions.

(3) Period of Decay: This period may be described as one of interval. The rate has reached its greatest concentration under existing conditions. The number of new trees formed each year is smaller as the forest matures and the living pine foliage and defoliation of trees by the rust before sporadic production can take place. Thus, the gradual elimination by death of all white pine trees is complete to the degree that white pine is no longer an important part of the forest stand. Young white pines, as they are produced by germinating seed in the duff, are killed very rapidly, eventually eliminating even the source of seed from some areas or that which is stored in the duff. The length of this period is indefinite. It continues as long as living pine foliage is present and the sensitive fiber factor remains. Studies of pine infection in this region, particularly in northeastern Minnesota, indicate that on areas where fires and white pine are closely associated the rust builds up so rapidly that in 5 to 15 years after the rust starts there is nearly complete pine infection and shortly thereafter, elimination of white pine from the forest stand.

Control Accomplishments in 1945

Initial and rework in 1945 were performed on the Red River, Lac Courte Oreilles and Mille Lacs Reservations in Minnesota. Initial work only was done on the Grand Portage Reservation, Minnesota and Lac du Flambeau Reservation, Wisconsin. Rework only was done on the Red Lake Reservation, Minnesota. As noted in Year Value II, 5,841 acres of control area were cleared initially of 808,305 vines to protect 5,841 acres of pine at a cost of 3,885 man-days. As second working 1,018 acres of white pine were protected by the removal of 216,516 vines from 1,419 acres of control area at a cost of 1,793 man-days. These vines were abundant as indicated by the fact that for all eradication in 1945 there was an average of 1 1/4 vines destroyed per acre, greatest on the Grand Portage, Minnesota, where there was an average of 1.41 vines per acre destroyed.

All of this control work was performed on the basis of plans agreed upon by the Indian Service and the Forest Pest Control Organization. Indian labor was used exclusively. As in 1944 and 1945, Indian women made up a high proportion of the Indian eradication crew. Indian men and women were used as crew foreman, and in general, the direct supervision of the work was handled by Indians. The Bureau of Entomology and Plant Quarantine provided technical direction and training to field men, made or revised necessary maps, checked the adequacy of control work, kept records of work done, and prepared the necessary reports.

In the selection of areas to be worked in 1945, great care was taken to make sure that the utmost in terms of pine protected would be obtained

from later logskeds. There stands of young white pine of most sizes and in such the rust was intensifying at the most rapid rate were worked.

Checking

In Test Table 12, results of checking after river eradication in 1945 are shown. It is gratifying to note that all but 43 acres of the 6,244 acres worked and checked passed as satisfactory. The check showed river working after eradication at the rate of 3.6 bushes and 7.2 P.C.R. per acre. This is a good showing.

General Status of Control

In Test Table 13, the status of blister rust control on Indian Reservations on December 31, 1945 is shown. The total white pine on Indian Reservations in the Region listed for protection amounts to 91,869 acres and involves a control area of 108,510 acres. Of this total acreage of pine, 44,385 acres or 85.5 percent have been initially protected, and 5,618 acres or approximately 11 percent are now on maintenance. It will be noted that initial work has now been completed on the San-Fur Reservation in Iowa, Tetonian, Nett Lake and White Earth Reservations in Minnesota and on the Lac du Flambeau Reservation in Wisconsin. The major problem remaining includes rework for ribes of a high proportion of the control area and the completion of initial eradication on a smaller portion.

In general, ribes are more abundant on all Indian Reservation lands than the average. The fact that such a high proportion of Indian white pine forests has been initially worked, and the absence of serious damage to white pine from blister rust, speak very well for the effective manner in which the Indian Service has performed blister rust control.

A distinction should be emphasized between "Net" acres worked and "Gross" acres worked. In Table 13 it is shown that the "Net" acres initially worked is 79,474. In Table 14 there are reported 88,366 "Gross" acres initially worked. "Gross" acres are simply the accumulation of acres worked each year. "Net" acres represent our best knowledge of acres worked and retained in the control problem. The difference between "Gross" and "Net" represents acres thrown out of control problem because sufficient pine values no longer exist, due to fire, logging, grazing, etc.

Status of Control by Reservations

NOTE: See 1943 Report for individual Reservation maps.

pine is an unprotected plantation, established in 1937 and 1938, and young trees are being infected. Many of the cankers found appeared to have originated in 1937. Only a small amount of scouting for the rust has been performed on the reservation. It is believed that such scouting would show that pine infection is widely distributed and is intensifying rapidly in unprotected stands. Fortunately, the main body of the white pine has been protected initially, and it is believed that there will be no serious loss from the rust if this protected condition can be maintained.

Ribes eradication performed in 1945 was severe and could work over an area originally covered several years ago. Indian Service men, consisting of both Indian men and women put in 200 man-days in removing 25,167 ribes from 220 acres to protect 123 acres of white pine.

Scouting after eradication showed ribes at the rate of 6.6 bushes with 11.9 F.L.B. per acre. Of the 220 acres worked, 172 showed less than 10 F.L.B. and 48 more than 25 F.L.B. per acre after ribes eradication.

No specific work is planned for 1946. In general, prompt and extensive control work has prevented serious loss from blister rust to young white pines.

Devil's Lake Indian Reservation - Minnesota

There are 92 acres of natural white pine with a control area of 140 acres on the Reservation. All of this has been initially worked several years ago.

No work was done in 1944 or 1945. During 1943 the entire 140 acres of control area were given almost eradication by the removal of 26,669 ribes at a cost of 235 man-days. Ribes were abundant on rework, averaging 180 per acre. Labor consisted of one crew of seven Indians, young girls and old men, under the leadership of a local stray boss. The crew worked slowly but performed thorough eradication work.

While ribes infection is general in this locality, pine infection was found for the first time near the western edge of the pine area in 1943. It is expected, however, that eradication has been sufficiently timely to prevent serious loss. Logging performed in 1944 has decreased considerably and stimulated ribes growth. The area should be again worked in 1946, since there are young white pines coming in following logging. It is estimated 177 man-days will be required to work the 140 acres of control area.

Red Lake Indian Reservation - Minnesota

No work was done on the Red Lake Indian Reservation during 1943, 1944 and 1945, and the status of control remains the same as that shown in the 1942 Report. This Reservation contains the largest amount of white pine of all the Reservations located in Minnesota. There are 12,570 acres of white pine listed as worth protecting of which all but 78 acres have been given initial protection. While only 1,120 acres of white pine are shown as being on maintenance, it is probable that surveys would classify additional acres of white pine to this category.

Checking after eradication in 1945 showed ribes at a rate of 2.4 bushes and 4.1 F.L.S. per acre, with all 1,964 acres worked and checked showing less than 15.0 F.L.S. per acre.

In 1944, rust on both ribes and pine was found quite generally distributed, and causing some damage to young pines in unprotected areas. Two Infested trees were found on an area initially protected. However, these trees had reached 10 years old, which would indicate they were formed prior to initial eradication in 1938. In 1945 an unprotected area of white pine in 50th and 60th ranges is 5. 2. 40N. E. 36W. was found with a high percentage of reproduction affected with blister rust, and many pines dead.

In view of increased acreage of young pine found in 1944 and 1945, and the fact that rust is now present and intensifying at a rapid rate, an extended control program is recommended for the coming field season. In order to prevent as much loss as possible, as part of the 5 year program plan will be the working of 3,444 acres, mostly initial work, using an estimated 1,311 man-days.

Work on Flambeau Indian Reservation - Wisconsin

No work was performed in 1943 or 1944. In 1945, 2 men-days were used in initially protecting 133 acres of pine by removing 135 ribes from 352 groups of control area. There are 2,034 acres of natural white pine, involving a control area of 6,579 acres.

At the present time no infection on either white pine or ribes has been found. It is probable, however, that careful inspection throughout the season will show some infection.

The chief work at the present time is based on this Reservation is primarily in maintaining the areas that have been protected in order to prevent the spread of infection. From previous knowledge of conditions, it is probable that there is not a sufficient seed source available here as there is in other reservations in the region.

Expenditures

Expenditures for ribes eradication by Indian Reservations and sources of funds for 1945 are shown in Text Table 15. Regular Indian Service (5107) funds were spent on six reservations in the total amount of \$26,479.61. In addition \$5,784.83 of Wisconsin Indian Tribal funds were used in local control, making a total of \$32,264.44, furnished by the Indian Service. In addition, various miscellaneous amounts were spent by the Bureau of Entomology and Plant Quarantine for various purposes, such as mapping, surveying, checking, technical supervision, keeping of records, etc. Bureau of Entomology and Plant Quarantine funds were spent as part of its responsibility towards the control program on Indian Reservations.

Part Two: 12. Review of Control on Indian Communities, South Central Division,
on December 12, 1965 Net Acres

Indian Reservation	Total Control Problem				Totally Worked				Net Initially			
	Net Acres				Total Control				Net Acres			
	W. P.	R. P.	W. P.	W. P.	W. P.	R. P.	W. P.	W. P.	W. P.	R. P.	W. P.	W. P.
Sec-Pns	15	15	15	15	15	15	15	15	15	15	15	15
Gravel Portage	939	508	858	1,212	508	756	105	445	3,674	5,010	2,600	2,600
White Lake	3,032	58	5,130	6,748	58	6,932	72	238	1,120	2,600	2,600	2,600
Red Lake	12,311	259	12,570	12,832	197	19,582	72	186	-	-	-	-
Peterson	72	-	72	104	-	1,163	-	-	-	-	-	-
White Earth	477	16	1,675	1,263	18	1,163	-	-	-	-	-	-
Total	16,800	575	19,203	24,343	303	36,750	371	1,120	1,120	1,120	1,120	1,120
W. P.	16,800	575	19,203	24,343	303	36,750	371	1,120	1,120	1,120	1,120	1,120
Red Lake	6,510	13	6,731	16,774	13	6,731	8,757	3,257	24	24	24	24
Lac Courte Oreilles	6,000	108	6,108	16,851	128	6,108	2,304	7,407	245	245	245	245
Lac du Flambeau	5,094	-	2,004	6,577	-	6,577	6,579	6,579	-	-	-	-
Brasserie	37,117	339	17,750	2,813	339	25,718	2,995	6,466	555	555	555	555
Total	68,521	560	42,000	52,815	570	52,815	14,091	24,110	3,410	3,410	3,410	3,410
W. P.	68,521	560	42,000	52,815	570	52,815	14,091	24,110	3,410	3,410	3,410	3,410

Text Table 1b. (Cont'd) Summary of Local Control Performed on Indian Reservations,
North Central Region, from Inception to December 31, 1945.
All Agencies Gross Acres

Indian Reservation	Gross Acres W. P. Protected	Gross Acres Worked	Number of Sites Destroyed	Total 8-Hour Man-Days	Avg. per Acre Worked	
					Sites	Days
	<u>Third and Other Workings</u>					
Webb Lake, Minn.	72	107	21,280	410	198.3	3.76
Red Lake, Minn.	552	1,606	197,530	1,096	128.1	0.66
Verillion, Minn.	72	186	28,859	235	195.8	1.26
White Earth, Minn.	-	5	-	-	-	-
Oneida Reservation, Wis.	43	215	1,473	56	6.9	0.26
Menominee, Wis.	887	1,576	94,772	1,070	60.1	0.63
Total, Third & Other Workings	1,526	3,691	316,421	2,771	152.2	0.77
	<u>All Workings</u>					
Red-Yell, Iowa	55	706	17,054	226	34.2	0.34
Grand Portage, Minn.	774	1,273	1,641,611	2,866	1,289.6	2.25
Webb Lake, Minn.	7,428	10,541	840,924	4,256	79.8	0.10
Red Lake, Minn.	23,871	36,148	8,347,370	10,029	230.9	0.50
Verillion, Minn.	216	678	196,301	669	289.5	1.22
White Earth, Minn.	701	1,731	143,931	1,435	756.5	0.83
Oneida, Wis.	7,335	14,292	6,995,978	22,006	431.2	1.54
Oneida Reservation, Wis.	6,189	14,834	1,189,917	9,530	90.1	0.65
Lea du Lac, Wis.	3,931	12,164	566,527	2,769	14.6	0.23
Menominee, Wis.	27,434	46,845	11,829,816	44,618	258.5	0.92
Total, All Workings	77,284	109,172	31,900,000	706,126	154.3	0.76

Notes: All work reported in Text Table 1b was on funds provided through the Indian Service, except initial working of 375 acres, destruction of 5,306 sites, and use of 110 man-days, furnished by Bureau-State funds on White Earth Indian Reservation, Minnesota.

Table Table 15. Indian Service Funds Spent on Director's Office Council,
Bureau General Region, Calendar Year 1945

Reservation	I. S. Fund	Tribal Fund	Total
Grand Portage, Minn.	\$4,249.41	-	\$4,249.41
Sault Lake, Minn.	4,786.52	-	4,786.52
Sag River, Wis.	9,074.67	-	9,074.67
La Courte Oreilles, Wis.	4,886.99	-	4,886.99
La du Flambeau, Wis.	38.95	-	38.95
Menominee, Wis.	4,103.07	15,784.83	9,887.90
Grand Total	26,079.52	15,784.83	41,864.35

Table 2. (Contd.) Summary of bond issued by Federal and Operations Agencies,
Semi-Annual Report, July

State	Operative Agency	Amount Issued	Interest Due Plus Prepaid		Bonds Issued	Number of Bonds Issued	Total 8-10-1977 Days-1977 Days
			Current	7/1/77			
<u>Illinois</u>							
Illinois	Bureau-State	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
Illinois	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
Illinois	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
<u>Minnesota</u>							
Minnesota	Bureau-State	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
Minnesota	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
Minnesota	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
<u>Wisconsin</u>							
Wisconsin	Bureau-State	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
Wisconsin	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
Wisconsin	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
<u>Region</u>							
Region	Bureau-State	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
Region	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
	Bureau-County	1	1	1	1	1	1
<u>Total</u>							
Total							

(Cont'd)

Table 2. (Cont'd) Summary of Local Control by States and Operating Agencies,
North Central Region, 1945

State	Operating Agency	Number Areas	Aerial White Flies Prevented Federal	Planted	Total	Acres Worked	Number Ribes Destroyed	Total 8-Hour Man-Days Used
Illinois	Bureau-State	4	0	0	0	5,177	15,197	107
	Bureau-State	11	293	128	421	1,137	23,812	1,751
	Bureau-State	151	12,511	1,660	14,171	39,325	561,852	3,434
	Forest Service	39	3,937	541	4,478	10,502	143,129	3,616
	Total	165	15,738	2,209	17,947	65,804	742,988	5,484
Minnesota	Bureau-State	15	1,079	0	1,079	1,779	126,832	1,726
	Forest Service	21	764	461	1,225	1,895	307,910	2,184
	Indian Service	9	249	16	265	476	447,838	1,714
	Total	45	2,092	477	2,569	3,150	882,580	5,624
Wisconsin	Bureau-State	74	13,624	1,574	15,198	81,604	351,322	4,375
	Forest Service	10	305	1,088	1,393	3,236	135,888	1,360
	Indian Service	21	4,794	103	4,897	7,471	619,031	4,750
	Total	105	18,723	2,765	21,488	92,311	1,106,241	10,485
Region	Bureau-State	314	15,777	3,536	19,313	129,532	1,389,904	11,675
	Forest Service	70	5,226	2,030	7,256	15,631	586,927	5,160
	Indian Service	30	5,003	169	5,172	7,947	1,066,729	6,464
	Total	414	25,996	5,735	31,731	153,110	2,043,560	23,299

Table 2a. (Continued) Summary of Land Control by States and Ownership Classes, South Central Region, 1945

State	Ownership Class	Forest	Number Acres	Acres Under Plans Protected	Acres Worked	Number Trees Destroyed	Trees Surviving	
Initial Working (Continued)								
Texas	State and Private	San-Ped. Public	31	1,071	652	2,523	2,523	
		Private	705	25,515	701	26,214	26,214	
	Sub-total		736	26,586	1,353	28,737	28,737	
	Forest Service	All Forests	36	1,072	2	1,070	1,070	
	Indian Service	All Forests	11	1,071	2	1,070	1,070	
Region Total			736	26,586	1,353	28,737	28,737	
Second Working								
Arkansas	State and Private	Private	2	-	51	51	51	
		San-Ped. Public	2	15	112	112	112	
	Forest Service	Private	7	10	331	331	331	
		Sub-total		9	25	494	494	494
		All Forests	22	1,832	6,855	6,855	6,855	
Mississippi	State and Private	Private	65	6,104	27,442	27,442	27,442	
		San-Ped. Public	87	3,095	25,108	25,108	25,108	
	Forest Service	Private	15	1,342	6,331	6,331	6,331	
		Sub-total		9	1,135	2,760	2,760	2,760
		All Forests	26	3,120	1,931	1,931	1,931	
Louisiana	State and Private	Private	111	6,573	31,135	31,135	31,135	
		San-Ped. Public	2	-	187	187	187	
	Forest Service	Private	6	-	550	550	550	
		Sub-total		3	-	737	737	737
		All Forests	114	6,573	32,052	32,052	32,052	
Region Total			114	6,573	32,052	32,052	32,052	

(Continued)

Table 2A. (Cont'd.) Summary of Forest Control by Status and Ownership Classes,
North Central Region, 1945

State	Ownership Class	Forest	Number Areas	Forest White Pine Protected		Acres Marked	Mature 21st Year	Subst. Area Marked
				Subst.	Total			
Minnesota								
Minnesota	State and Private	Non-Fed. Public	1	-	175	217	15,256	6,603
		Private	1	48	48	48	3,522	
	Forest Service	Subtotal	2	48	223	265	18,778	
		Chippewa N. P.	1	-	43	43	3,911	
		State Lake	1	48	73	107	21,868	
Minnesota	State and Private	Non-Fed. Public	2	121	336	449	34,071	6,603
		Private	2	48	48	48	3,522	
	Forest Service	Subtotal	4	169	384	497	37,593	
		Chippewa N. P.	1	-	43	43	3,911	
		State Lake	1	48	73	107	21,868	
Minnesota	State and Private	Non-Fed. Public	11	1,052	1,994	3,009	111,445	6,603
		Private	11	111	717	2,631	21,865	
	Forest Service	Subtotal	22	1,163	2,711	5,640	133,310	
		All Forests	22	1,163	2,711	5,640	133,310	
		All Forests	22	1,163	2,711	5,640	133,310	
Grand Total			34	1,167	1,994	10,908	341,347	6,603
Illinois								
Illinois	State and Private	Non-Fed. Public	195	295	1,745	37,976	6,603	
		Private	169	169	3,382	8,105		
	Forest Service	Subtotal	364	464	5,127	46,081		
		Shawnee N. P.	1	1	50	1,471		
		State Lake	363	463	5,077	44,610		
Illinois	State and Private	Non-Fed. Public	45	298	1,282	187,210	6,603	
		Private	80	100	655	48,336		
	Forest Service	Subtotal	125	398	1,937	235,546		
		Shawnee N. P.	1	1	50	1,471		
		State Lake	124	397	1,887	234,075		

Table 23a (Cont'd) Summary of Local Control by States and Ownership Classifications
North Central Region, 1945

State	Ownership Class	Forest	Number Areas	Area Males Pine Protected		Area Males	Number Males Destroyed	Total Males Destroyed
				Natural	Planted			
All Workings (Cont'd)								
Minnesota (Cont'd)	Indian Service	Red River	5	-	-	813	-	813
		Leve Court District	5	1,979	93	1,971	-	1,971
		Leve du Fleuve	1	158	-	158	-	158
		Minnesota	9	1,929	10	1,935	-	1,935
		State-Total	20	3,906	103	4,009	-	4,009
	State and Private	State-Total	103	3,906	103	4,009	-	4,009
		State and Private	87	8,236	2,433	10,669	-	10,669
		Private	218	37,576	1,122	38,698	-	38,698
		State-Total	20	3,906	103	4,009	-	4,009
		State-Total	103	3,906	103	4,009	-	4,009
Forest Service	All Forests	18	2,191	3,051	5,242	-	5,242	
	Indian Service	30	2,005	103	2,108	-	2,108	
	All Forests	30	2,005	103	2,108	-	2,108	
Regional Total			103	17,006	5,745	22,751	-	22,751

Table 4. (Cont'd) Results of Cuscuta After Ribes Eradication by States and Ownership Classes,
North Central Region, 1945

Ownership Class	Number of Acres	Cuscuta After Eradication				Classification of Worked Acres on basis of Ribes F.L.S. per Acre			
		Acres Worked	Strip Acres	Ribes Found Number	Ribes per Acre F.L.S.	Remaining After Eradication		Total Acres	Over 25.0 F.L.S.
						Acres	Acres		
Forest Service	76	17,067	577.25	646	1.6	15,938	645	10	
Indian Service	82	6,844	96.81	349	5.6	5,185	1,010	18	
Govt-Ind. Public	79	18,146	125.33	928	2.2	16,671	1,270	3	
Private	167	83,151	1,165.04	1,853	1.6	95,319	2,617	215	
Region Total	304	105,048	2,279.43	3,673	2.0	105,048	5,542	246	
Percent ribes in each ribes abundance class						95.5%	3.9%		

Table 5. Control Area Permits, North Central Region, 1945

State	Season 1945	Number Applications Denied	Number Applications Approved	Number Applications Rejected	Percent Applications Approved	Approximate Number Man-Days
Michigan	Spring	1,523	1,537	91	94.4	11
	Fall	277	260	17	93.9	3
	Total	1,800	1,797	108	94.3	14
Minnesota	Spring	644	626	18	95.5	15
	Fall	92	90	2	97.8	3
	Total	736	716	20	97.2	18
Ohio	Spring	1,706	1,703	3	99.7	60
	Fall	294	294	0	100.0	30
	Total	1,999	1,997	2	99.9	90
Wisconsin	Spring	1,444	1,428	16	98.9	14
	Fall	174	173	1	99.4	2
	Total	1,618	1,601	17	99.0	16
Region	Spring	5,198	5,066	132	97.5	100
	Fall	637	617	20	97.6	33
	Total	5,835	5,683	152	97.4	133

1 - 40 Applications were denied permits; 60 voluntarily agreed not to plant ribes.

2 - 5 Applications were denied permits; 17 voluntarily agreed not to plant ribes.

3 - 3 Applications were denied permits; 12 voluntarily agreed not to plant ribes.

Table 3. (Cont'd) Summary of Local Control by States, Territory, and Possession Classes,
From Inspection to December 31, 1945, North Central Region
Grass Areas

State	Ownership Class	Grass Acres Under Plant Protection	Grass Acres Noted	Number of Ranches Inspected	Total B-Down Man-Days	Average Per Area Inspected		Number of Inspected Ranches
						Man-Days	Man-Days	
Initial Working (Cont'd)								
Alaska 1920-1945	Forest Service	27,306	65,907	4,835,437	50,161	73.3	0.46	141
	Indian Service	30,220	50,126	19,675,176	51,060	35.8	1.05	100
	Non-Federal Public	24,636	179,688	11,014,656	15,926	61.3	0.28	100
	Private	208,720	733,682	50,125,742	217,127	63.6	0.30	100
Oregon 1927-1945	Forest Service	121,016	204,240	19,731,392	37,615	67.7	0.33	100
	Indian Service	49,939	88,368	39,857,380	77,713	336.6	0.88	100
	National Park Service	15	120	13	-	0.1	-	100
	Non-Federal Public	249,446	712,363	44,860,969	189,215	60.5	0.16	100
	Private	227,159	1,379,947	124,623,655	485,665	62.9	0.25	100
Second Working								
Tennessee 1935-1945								
Tennessee 1935-1945	Non-Federal Public	1,903	7,106	550,537	2,150	70.9	0.30	100
	Private	362	3,079	49,505	352	16.1	0.12	100
Tennessee 1935-1945	Non-Federal Public	919	4,977	10,939	209	3.4	0.02	100
	Private	337	5,010	14,504	672	14.8	0.22	100
Tennessee 1935-1945	Indian Service	10	805	3,992	37	17.4	0.23	100
	Non-Federal Public	204	1,450	243,969	1,772	169.0	1.23	100
	Private	473	2,745	120,790	1,129	44.0	0.21	100
Tennessee 1935-1945	Forest Service	17,334	22,134	843,630	1,518	20.0	0.19	100
	Non-Federal Public	27,512	39,136	2,357,165	44,835	21.8	0.13	100
	Private	24,390	100,840	4,101,385	24,446	23.7	0.14	100

TABLE 1. (Continued) Summary of Land Destroyed by Bombs, Bombed, or Firebombing from September to November 1945, State Capital Areas
DOLLAR AREA

State	Ownership Class	Gross Acres Wholly Plus Partially	Gross Acres Bombed	Number of Buildings Destroyed	Total Squar Meters	Average Per Acres Bombed		Number of Persons Killed
						Sq. Meters	Sq. Meters	
Alabama 1945-1946	Forest Service	14,661	25,843	1,205,310	9,381	52.2	0.43	130
	Indian Service	13,820	19,823	2,054,488	9,300	108.0	0.43	201
	Non-Federal Public	8,619	15,082	1,050,136	6,829	83.7	0.41	108
	Private	10,010	45,712	2,656,305	11,515	95.0	0.25	221
Arkansas 1945-1946	Non-Federal Public	1,216	15,135	312,326	6,975	20.2	0.45	35
	Private	2,027	19,669	356,705	4,206	16.3	0.24	75
California 1945-1946	Forest Service	4,300	19,596	610,007	6,253	34.8	0.32	112
	Indian Service	15,759	27,878	2,010,810	16,557	100.8	0.59	112
	Non-Federal Public	29,663	70,777	1,027,296	9,300	11.2	0.12	142
	Private	36,722	131,656	2,936,282	25,167	15.1	0.13	111
Oregon 1945-1946	Forest Service	22,755	65,317	2,694,151	23,782	31.5	0.27	111
	Indian Service	27,569	17,107	1,868,790	25,314	105.4	0.55	201
	Non-Federal Public	60,254	204,083	3,518,399	49,169	25.9	0.15	197
	Private	134,986	146,060	17,507,596	67,802	23.0	0.15	111
Tennessee 1945-1946	Non-Federal Public	1,852	6,057	704,857	4,169	57.6	0.46	140
	Private	179	1,719	72,179	601	15.3	0.13	111
Texas 1945-1946	Non-Federal Public	624	2,100	11,979	175	5.0	0.07	48
	Private	80	1,099	1,028	6	2.1	0.01	171

(Continued)

Table 9. (Continued) Summary of Local Control by Blazes, Workings, and Ownership Classes,
From Inception to December 31, 1945, North Central Region
Gross Acres

State	Ownership Class	Gross Acres Active Protected	Gross Acres Worked	Amount of Blazes Destroyed	Total 8-Hour Man-Days	Average per Acres Worked		Average Blazes Destroyed Per Acre
						Blazes	Man-Days	
Ohio 1945-1945 Non-Federal Public								
Ohio 1945-1945	Forest Service	1,525	3,000	91,029	571	19.7	0.19	200
	Non-Federal Public	6,504	12,092	123,609	1,432	18.5	0.14	145
	Private	8,116	17,491	281,747	2,759	21.3	0.15	111
Ohio 1945-1945 Forest Service								
Ohio 1945-1945	Forest Service	1,043	7,359	236,617	1,693	20.0	0.32	112
	Non-Federal Public	995	1,305	247,669	1,671	189.9	0.33	111
	Private	1,773	2,105	239,939	1,402	49.3	0.59	104
Ohio 1945-1945 Non-Federal Public								
Ohio 1945-1945	Forest Service	100	100	10,000	100	65.2	0.24	111
	Non-Federal Public	100	1,000	2,000	195	1.9	0.18	111
	Private	799	5,111	110,019	1,317	20.2	0.34	71
Ohio 1945-1945 Forest Service								
Ohio 1945-1945	Forest Service	1,037	1,270	25,931	373	20.9	0.05	111
	Non-Federal Public	930	1,731	16,202	1,120	57.7	0.51	111
	Private	3,462	8,355	37,870	380	4.5	0.06	111
Ohio 1945-1945 Non-Federal Public								
Ohio 1945-1945	Forest Service	6,005	11,005	115,000	2,097	25.4	0.20	111
	Non-Federal Public	1,005	3,617	30,921	2,737	93.0	0.76	111
	Private	8,075	23,774	950,538	6,505	36.9	0.25	111
Ohio 1945-1945 Forest Service								
Ohio 1945-1945	Forest Service	14,816	17,537	656,902	5,621	17.5	0.15	111
Ohio 1945-1945 Non-Federal Public								
Ohio 1945-1945	Forest Service	1	1	1	1	1	1	1
	Non-Federal Public	1,005	22,235	2,000,000	7,344	33.6	0.30	111
	Private	1,005	18,911	1,000,000	1,000	51.6	0.10	111

Table 10. Summary of 1993 expenditures for maintenance of forests, lands, and waters, and operating expenses, 1991 to 2000. (Units: millions of dollars)

Ownership Class	Operating Agency	Forest Service	Wildlife	Recreation
<u>Illinois</u>				
Forest Service	Bureau-State	1,150	1,150	1,150
Non-Federal Public	Bureau-State	1,150	1,150	1,150
Private	Bureau-State	1,150	1,150	1,150
<u>Indiana</u>				
Forest Service	Bureau-State	1,150	1,150	1,150
Non-Federal Public	Bureau-State	1,150	1,150	1,150
Private	Bureau-State	1,150	1,150	1,150
<u>Iowa</u>				
Forest Service	Bureau-State	1,150	1,150	1,150
Non-Federal Public	Bureau-State	1,150	1,150	1,150
Private	Bureau-State	1,150	1,150	1,150
<u>Michigan</u>				
Forest Service	Bureau-State	1,150	1,150	1,150
Non-Federal Public	Bureau-State	1,150	1,150	1,150
Private	Bureau-State	1,150	1,150	1,150

(Continued)

Table 4a. (Cont'd.) Summary of Ribes Annihilation, All Workings, by States, Swadiship Glenside, and Operating Agencies, 1917 to 1945, North Central Region
Gross Acres

Operating Class	Operating Agency	Gross Acres Worked	Ribes Destroyed	Man-Days Used	
Forest Service	Minnesota	Forest Service Bureau-State	6,394,697 2,500,625	42,411 7,574	
		Indian Service Bureau-State	11,005,501 5,306	27,345 116	
Non-Federal Public Private	Minnesota	Non-Federal Public Bureau-State	11,005,501 5,306	27,345 116	
		Private Bureau-State	11,005,501 5,306	27,345 116	
Total, Minnesota		67,017	11,005,501	27,345	
Forest Service	Ohio	Forest Service Bureau-State	5,000,252 503,925	35,393 2,924	
		Indian Service Bureau-State	2,000,000 200,000	15,000 1,500	
Non-Federal Public Private	Ohio	Non-Federal Public Bureau-State	2,000,000 200,000	15,000 1,500	
		Private Bureau-State	2,000,000 200,000	15,000 1,500	
Total, Ohio		9,000,252	50,813	3,924	
Forest Service	Minnesota	Forest Service Bureau-State	67,217 19,556	5,000,252 503,925	35,393 2,924
		Indian Service Bureau-State	2,000,000 200,000	15,000 1,500	15,000 1,500
Non-Federal Public Private	Minnesota	Non-Federal Public Bureau-State	2,000,000 200,000	15,000 1,500	15,000 1,500
		Private Bureau-State	2,000,000 200,000	15,000 1,500	15,000 1,500
Total, Minnesota		71,217	5,000,252	35,393	
Forest Service	Ohio	Forest Service Bureau-State	5,000,252 503,925	35,393 2,924	35,393 2,924
		Indian Service Bureau-State	2,000,000 200,000	15,000 1,500	15,000 1,500
Non-Federal Public Private	Ohio	Non-Federal Public Bureau-State	2,000,000 200,000	15,000 1,500	15,000 1,500
		Private Bureau-State	2,000,000 200,000	15,000 1,500	15,000 1,500
Total, Ohio		9,000,252	50,813	3,924	

Table 100. Water Control Project Expenditures Classified by Appropriation and Activity, 1945

Source of Funds	Class of Expenditure	Leadership and Administration	Land(s) Acquired	Survey and Planning	Construction	Other Field Work and	Total	Percent Total
Private	Salaries	\$11,888.62	\$23,501.40	\$635.00	\$251.75	\$1,515.50	\$15,570.94	\$43,089.29
	Non-salaries	7,701.24	4,557.71	125.00	-	317.54	3,590.17	16,159.56
	Total	19,589.86	28,059.11	760.00	251.75	1,833.04	19,160.94	59,249.85
	Salaries	10,857.20	1,536.91	275.00	483.21	1,506.09	5,802.17	67,602.32
Bureau	Non-salaries	7,021.82	1,131.02	-	12.32	172.85	468.36	9,144.37
	Total	17,879.02	2,667.93	275.00	495.53	1,678.94	6,270.53	73,746.69
	Salaries	-	51,572.00	305.02	511.60	3,687.77	1,559.07	57,267.85
	Non-salaries	-	6,180.20	-	282.59	753.49	798.28	5,326.65
F.S. 1104	Total	-	57,752.20	305.02	794.19	4,441.26	2,357.35	62,145.72
	Salaries	-	37,141.50	65.104	-	-	-	37,196.60
	Non-salaries	-	1,618.46	-	-	-	-	1,618.46
	Total	-	38,760.00	65.104	-	-	-	38,825.10
I.S. 3107 and Tribal	Salaries	-	27,815.74	-	-	1,372.97	-	29,188.71
	Non-salaries	-	776.37	-	-	113.46	-	889.83
	Total	-	28,592.11	-	-	1,486.43	-	30,078.54
	Salaries	88,145.30	117,305.25	911.75	1,201.36	7,886.69	16,903.30	236,483.11
Barton	Non-salaries	14,730.36	12,527.85	153.00	295.52	1,353.34	4,616.61	33,746.67
	Total	102,875.66	129,833.10	1,064.75	1,496.88	9,240.03	21,519.91	270,239.11
	Salaries	-	-	-	-	-	-	-
	Non-salaries	-	-	-	-	-	-	-

a - Includes value of cultivated rice destroyed: \$1.50 from Iowa; \$116.00 from Wisconsin, private funds.

b - Includes \$117.65 of O.B.C. elimination work in Iowa, Bureau 3604 funds.

c - Includes \$5,794.65 of expenses (Wisconsin) Tribal funds.

d - Includes \$25.50 of O.P.F. funds spent on Native Forest, Minnesota; and \$19.50 a.c.s. funds in Michigan.

Notes: In Government suballotments in Minnesota net wages are shown (gross wages less board

deductions of \$10 per month). Food supplies for wages, \$1,480.72, were considered as a salary item.

Board deductions amounted to \$4,771.00. The difference, \$2,500.72, was used for wages of men

and equipment.

TABLE 1 - SHEET 1

SUMMARY OF RIME AMPLIFICATION BY STATES AND OPERATING AGENCIES - 1945

State	Operating Agency	First Warning			Second Warning			Other Warnings		
		Agreed With Rime	Total Acres	Adm- Days	Agreed Acres	Adm- Days	Adm- Days	Agreed Acres	Adm- Days	Other Warnings
Illinois	Bureau-State	2,453	6,125	1,039	26,198	2,083	5,031	31,050		
	Bureau-State	-	8,135	1,039	194,021	2,083	3,950	18,618		
	For. Service	-	2,616	860	25,892	566	1,845	63,695		
Minnesota	Bureau-State	-	1,473	1,411	102,014	1,411	266	18,618		
	For. Service	-	1,061	1,410	220,498	1,410	75	3,273		
	Ind. Service	-	256	305	361,211	305	107	21,843		
Mississippi	Bureau-State	-	61,593	1,329	194,260	1,329	197,032	123,363		
	For. Service	-	-	-	-	-	2,712	1,147		
	Ind. Service	-	3,005	3,000	647,094	3,000	1,535	22,628		
Ohio	Bureau	2,030	74,019	4,735	127,183	5,621	1,735	123,363		
	For. Service	-	3,607	1,070	204,310	1,070	2,440	2,119		
	Ind. Service	-	5,801	3,685	608,305	3,685	757	43,303		
Grand Totals		5,483	81,297	10,430	54,577	10,430	39,848	14,317		

Notes: Not included in these tables, but included in the Cumulative Tables are the following acres of control area placed on permanent acreage from permanent records in 1945 because they were rime-free: Indiana, 1,287 acres; Ohio, 5,687 acres; totals 6,974 acres.

TABLE 1 - Sheet 7

QUANTITY OF FISHES EXTRACTED OF TROPICAL LAKE, 1915

Tropical Lake	First Working				Second Working				Other Working			
	Lake	Area	Total Area	Days	Total Area	Days	Total Area	Days	Total Area	Days	Total Area	Days
Grand Portage, Minnesota	-	250	250	500	-	-	-	-	-	-	-	-
North Lake, Minnesota	-	-	-	-	141	65,907	500	500	107	21,380	500	500
Grand River, Wisconsin	-	1,111	1,111	1,111	193	12,158	970	970	-	-	-	-
Laurel Court Overlook, Illinois	-	1,100	1,100	500	600	7,629	179	179	215	1,473	500	500
Laurel Court Overlook, Illinois	-	392	392	2	-	-	-	-	-	-	-	-
Wisconsin, Wisconsin	-	2,100	2,100	1,200	500	17,322	449	449	105	21,156	500	500
Total	-	3,250	3,250	3,250	1,400	21,911	1,700	1,700	307	21,911	1,700	1,700

TABLE 2 - SUMMARY

AVERAGE WEIGHT OF CATTLE FIRST LAMB 1945

National Figures	First Laying				Second Laying	All
	Area	Area	Total	Area	Area	Area
Illinois	50	2,616	2,616	50	50	50
Indiana	-	-	-	-	-	-
Michigan	-	-	-	-	-	-
Ohio	-	-	-	-	-	-
Wisconsin	-	-	-	-	-	-
Minnesota	-	-	-	-	-	-
Nebraska	-	-	-	-	-	-
South Dakota	-	-	-	-	-	-
Montana	-	-	-	-	-	-
Wyoming	-	-	-	-	-	-
Idaho	-	-	-	-	-	-
Utah	-	-	-	-	-	-
Arizona	-	-	-	-	-	-
California	-	-	-	-	-	-
Alaska	-	-	-	-	-	-
Hawaii	-	-	-	-	-	-
Total	50	2,616	2,616	50	50	50

TABLE 2 - SUMMARY

AVERAGE WEIGHT OF CATTLE FIRST LAMB 1945

National Figures	First Laying				Second Laying	All
	Area	Area	Total	Area	Area	Area
Illinois	50	2,616	2,616	50	50	50
Indiana	-	-	-	-	-	-
Michigan	-	-	-	-	-	-
Ohio	-	-	-	-	-	-
Wisconsin	-	-	-	-	-	-
Minnesota	-	-	-	-	-	-
Nebraska	-	-	-	-	-	-
South Dakota	-	-	-	-	-	-
Montana	-	-	-	-	-	-
Wyoming	-	-	-	-	-	-
Idaho	-	-	-	-	-	-
Utah	-	-	-	-	-	-
Arizona	-	-	-	-	-	-
California	-	-	-	-	-	-
Alaska	-	-	-	-	-	-
Hawaii	-	-	-	-	-	-
Total	50	2,616	2,616	50	50	50

TABLE 3

SUMMARY OF FIELD WORK DONE FROM SEPTEMBER BY STATES AND POSSESSIONS JANUARY 1965

State	Operating Agency	Number of Personnel	Days	Number Worked	Insect Control			Diseases		
					Number Worked	Number Days	Number Days	Number Worked	Number Days	Number Days
Alabama	Alabama State	15	1	1	1,331	1,331	15	1,331	1,331	15
Alaska	Alaska State	15	1	1	1,331	1,331	15	1,331	1,331	15
Arizona	Arizona State	15	1	1	1,331	1,331	15	1,331	1,331	15
Arkansas	Arkansas State	15	1	1	1,331	1,331	15	1,331	1,331	15
California	California State	15	1	1	1,331	1,331	15	1,331	1,331	15
Colorado	Colorado State	15	1	1	1,331	1,331	15	1,331	1,331	15
Connecticut	Connecticut State	15	1	1	1,331	1,331	15	1,331	1,331	15
Delaware	Delaware State	15	1	1	1,331	1,331	15	1,331	1,331	15
Florida	Florida State	15	1	1	1,331	1,331	15	1,331	1,331	15
Georgia	Georgia State	15	1	1	1,331	1,331	15	1,331	1,331	15
Hawaii	Hawaii State	15	1	1	1,331	1,331	15	1,331	1,331	15
Idaho	Idaho State	15	1	1	1,331	1,331	15	1,331	1,331	15
Illinois	Illinois State	15	1	1	1,331	1,331	15	1,331	1,331	15
Indiana	Indiana State	15	1	1	1,331	1,331	15	1,331	1,331	15
Iowa	Iowa State	15	1	1	1,331	1,331	15	1,331	1,331	15
Kansas	Kansas State	15	1	1	1,331	1,331	15	1,331	1,331	15
Kentucky	Kentucky State	15	1	1	1,331	1,331	15	1,331	1,331	15
Louisiana	Louisiana State	15	1	1	1,331	1,331	15	1,331	1,331	15
Maine	Maine State	15	1	1	1,331	1,331	15	1,331	1,331	15
Maryland	Maryland State	15	1	1	1,331	1,331	15	1,331	1,331	15
Massachusetts	Massachusetts State	15	1	1	1,331	1,331	15	1,331	1,331	15
Michigan	Michigan State	15	1	1	1,331	1,331	15	1,331	1,331	15
Minnesota	Minnesota State	15	1	1	1,331	1,331	15	1,331	1,331	15
Mississippi	Mississippi State	15	1	1	1,331	1,331	15	1,331	1,331	15
Missouri	Missouri State	15	1	1	1,331	1,331	15	1,331	1,331	15
Montana	Montana State	15	1	1	1,331	1,331	15	1,331	1,331	15
Nebraska	Nebraska State	15	1	1	1,331	1,331	15	1,331	1,331	15
Nevada	Nevada State	15	1	1	1,331	1,331	15	1,331	1,331	15
New Hampshire	New Hampshire State	15	1	1	1,331	1,331	15	1,331	1,331	15
New Jersey	New Jersey State	15	1	1	1,331	1,331	15	1,331	1,331	15
New Mexico	New Mexico State	15	1	1	1,331	1,331	15	1,331	1,331	15
New York	New York State	15	1	1	1,331	1,331	15	1,331	1,331	15
North Carolina	North Carolina State	15	1	1	1,331	1,331	15	1,331	1,331	15
North Dakota	North Dakota State	15	1	1	1,331	1,331	15	1,331	1,331	15
Ohio	Ohio State	15	1	1	1,331	1,331	15	1,331	1,331	15
Oklahoma	Oklahoma State	15	1	1	1,331	1,331	15	1,331	1,331	15
Oregon	Oregon State	15	1	1	1,331	1,331	15	1,331	1,331	15
Pennsylvania	Pennsylvania State	15	1	1	1,331	1,331	15	1,331	1,331	15
Rhode Island	Rhode Island State	15	1	1	1,331	1,331	15	1,331	1,331	15
South Carolina	South Carolina State	15	1	1	1,331	1,331	15	1,331	1,331	15
South Dakota	South Dakota State	15	1	1	1,331	1,331	15	1,331	1,331	15
Tennessee	Tennessee State	15	1	1	1,331	1,331	15	1,331	1,331	15
Texas	Texas State	15	1	1	1,331	1,331	15	1,331	1,331	15
Utah	Utah State	15	1	1	1,331	1,331	15	1,331	1,331	15
Vermont	Vermont State	15	1	1	1,331	1,331	15	1,331	1,331	15
Virginia	Virginia State	15	1	1	1,331	1,331	15	1,331	1,331	15
Washington	Washington State	15	1	1	1,331	1,331	15	1,331	1,331	15
West Virginia	West Virginia State	15	1	1	1,331	1,331	15	1,331	1,331	15
Wisconsin	Wisconsin State	15	1	1	1,331	1,331	15	1,331	1,331	15
Wyoming	Wyoming State	15	1	1	1,331	1,331	15	1,331	1,331	15
Zones										
Alaska										
Arizona										
California										
Colorado										
Connecticut										
Delaware										
Florida										
Georgia										
Hawaii										
Idaho										
Illinois										
Indiana										
Iowa										
Kansas										
Kentucky										
Louisiana										
Maine										
Maryland										
Massachusetts										
Michigan										
Minnesota										
Mississippi										
Missouri										
Montana										
Nebraska										
Nevada										
New Hampshire										
New Jersey										
New Mexico										
New York										
North Carolina										
North Dakota										
Ohio										
Oklahoma										
Oregon										
Pennsylvania										
Rhode Island										
South Carolina										
South Dakota										
Tennessee										
Texas										
Utah										
Vermont										
Virginia										
Washington										
West Virginia										
Wisconsin										
Wyoming										

1 - 10,000 plants grown, 1,000 with insects.

2 - 10,000 plants grown, 1,000 with insects.

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TABLE 4 - SERIES 2

AMOUNT OF EXPENDITURES - FEDERAL AND COMPONENT 1965

State	Fiscal Year	Cooperative Funds - direct bill	Total	Expenditures Chargeable To	Average Cost per	
					acre	effective acre
Alabama	1965/1966	-	43,573.48	13,637.17	3.27	2.11
Ark.	1965/1966	100.00	5,754.87	13,679.22	7.28	1.21
California	1965/1966	-	9,999.45	37,225.15	3.75	7.57
Colorado	1965/1966	100.00	10,037.47	48,086.86	11.71	6.19
Wisconsin	1965/1966	-	115.06	57,595.90	0.52	5.19
Total	1965/1966	200.00	68,362.86	109,628.40	1.96	3.00

TABLE 8 - SHEET 2

STATUS OF KING GRADUATION ON NATIONAL PARK LANDS, DECEMBER 31, 1945

National Park Lands	Total Acres			Percent Working Forest	Percent Private	Percent Other	Percent Total
	State	Federal	Private				
State of Michigan, Michigan							
Status of Forest Graduation on State and Private Lands, December 31, 1945							
Michigan	2,154	32,223	17,096	60.9	10,181	11,507	18.5
Michigan	6,298	78,711	72,678	100.0	7,067	2,899	23.2
Michigan	5,611	57,169	22,227	55.8	1,800	675	28.5
Michigan	387,946	1,105,600	975,740	81.1	230,096	30,012	22.1
Michigan	131,503	1,077,001	281,031	69.2	61,004	2,858	13.6
Michigan	18,106	122,631	181,306	12.9	14,820	6,975	15.6
Michigan	311,139	1,320,513	897,819	74.6	204,873	6,355	11.0
Total Michigan							
				74.6	204,873	6,355	11.0

TABLE 8 - SHEET 2

STATUS OF KING GRADUATION ON NATIONAL PARK LANDS, DECEMBER 31, 1945

Michigan Lands									
	1945	500	500	100.0	306	-	-	-	1,085
Grand Portage, Minn.	9.8	1,212	755	60.9	515	-	-	0.0	-
Grand Lake, Minn.	5,130	6,992	6,999	100.0	3,377	107	5,010	71.7	236
Grand Lake, Minn.	12,570	13,000	12,965	98.8	11,752	1,638	2,825	14.5	-
Grand Marais, Minn.	72	105	100	100.0	205	126	-	0.0	-
Grand Marais, Minn.	-	4,109	4,165	100.0	372	5	-	0.0	-
Grand Marais, Minn.	1,201	16,715	15,767	94.6	9,051	-	125	0.7	8,201
Grand Marais, Minn.	1,201	16,715	15,767	94.6	9,051	215	800	1.9	7,135
Grand Marais, Minn.	1,201	16,715	15,767	94.6	9,051	-	-	0.0	-
Grand Marais, Minn.	1,201	16,715	15,767	94.6	9,051	1,776	800	1.9	8,365

TABLE 1 - 1962

NUMBER OF STAFF OF THE BUREAU OF LAND MANAGEMENT, 1962-1963

Land Ownership	White Man	Total Acres		Forest Land	Forest Land Per Ac	Forest Land Per Ac	Forest Land Per Ac	Forest Land Per Ac	Forest Land Per Ac	Accumulative Series	
		(B.L.M. P.A. Proj.)	(B.L.M. P.A. Proj.)							Forest Land	Accumulative Series
National Forests	102,001	102,250	274,025	17.1	100.0	100.0	100.0	100.0	100.0	102,250	102,250
State Forests	15	100	100	100.0	100.0	100.0	100.0	100.0	100.0	100	100
Private Land	51,699	102,510	79,616	79.7	100.0	100.0	100.0	100.0	100.0	102,510	102,510
State & Private Land	66,798	204,760	2,173,465	71.2	100.0	100.0	100.0	100.0	100.0	2,173,465	2,173,465
Total	169,495	409,520	3,147,106	100.0	100.0	100.0	100.0	100.0	100.0	3,147,106	3,147,106

TABLE C - SHEET 2

SUMMARY OF LINES ELIMINATED BY BRANCH AND OPERATIVE AGENCIES 1915 - 1945

Station	Operating Agency	Other Workings				All Workings				Per Acre	
		Advised		Days	Acres	With Doubt	With Acres	Total Acres	Destroyed	Days	
		Advised	Days								
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TABLE C - Sheet 5

CUMULATIVE SUMMARY OF RIBES EXAMINATIONS REQUESTED BY LOCAL AUTHORITIES, 1918 - 1925

Localities	First Working			Second Working			Third and Other Workings			All Workings		
	Acres	Ribes Destroyed	Days	Acres	Ribes Destroyed	Days	Acres	Ribes Destroyed	Days	Acres	Ribes Destroyed	Days
San-Juan, N.M.	500	15,652	169	285	3,592	57	-	-	-	785	17,054	-
Fort Lake, N.M.	7,057	516,344	1,629	3,577	503,350	2,227	207	21,290	340	10,534	540,934	3,309
Grand Porters, N.M.	197	2,497,110	2,171	316	154,901	575	-	-	-	2,873	2,651,611	2,746
Red Lake, N.M.	19,783	6,629,011	60,782	14,732	1,521,399	6,151	1,608	197,530	1,096	36,118	8,347,870	39,039
Vermillion, N.M.	236	137,539	124	206	23,312	210	104	28,899	235	670	196,301	350
White Earth, N.M.	979	295,597	2,004	370	45,236	627	5	-	-	2,384	1,07,625	4,300
Red River, N.M.	9,223	7,338,276	37,709	5,061	1,113,702	4,297	-	-	-	14,250	8,995,078	22,006
San Geronimo, N.M.	9,904	1,041,950	7,360	4,710	146,104	1,312	215	1,473	56	14,334	1,309,311	3,300
San de Plumbach, N.M.	6,579	546,713	2,600	5,585	19,606	189	-	-	-	14,164	566,319	6,179
San Juan, N.M.	32,717	10,204,037	32,769	12,532	1,531,000	10,753	1,575	94,779	1,070	46,845	11,829,816	44,819
Total	97,785	79,087,300	73,203	47,497	16,446,790	35,311	2,188	143,522	3,391	148,737	94,088,078	104,814

TABLE D - SHEET 1

ACCUMULATIVE SUMMARY OF DEEDS ACQUIRED BY THE STATE OF MINNESOTA 1918 - 1915

National Forests	Forest Working				Seeded Working Acres	Other Working Acres	All Working Acres
	Acres Without Riparian	Acres With Riparian	Total Acres				
Shumaker, Illinois	50	-	50	-	-	-	50
Buron, Michigan	-	6,361	6,361	766	-	-	7,127
Bandelier, Michigan	-	66,532	66,532	9,017	-	-	76,549
Barquette, Michigan	-	25,012	25,012	8,307	-	490	33,809
Bismarck, Michigan	-	24,065	24,065	11,516	-	1,160	37,112
Ottawa, Michigan	-	24,985	24,985	11,028	-	1,090	37,663
Superior, Minnesota	-	39,700	39,700	14,681	-	6,165	60,546
Chippewa, Minnesota	-	39,698	39,698	9,162	-	1,094	49,954
Wayne, Ohio	-	1,875	1,875	-	-	-	1,875
Chequamegon, Wisconsin	-	37,754	37,754	6,068	-	1,270	47,092
Violet, Wisconsin	-	28,153	28,153	10,728	-	-	38,881
Total	50	244,980	245,030	45,373	-	11,007	271,410

TABLE U - SHEET 3

ACCUMULATIVE SUMMARY OF HERR ACRES WORKED BY LAND OWNERSHIP 1910 - 1945

Indian Lands	First Working				Total Acres	Second Working Acres	Other Working Acres	All Working Acres
	Acres Without Hills	Acres With Hills						
Sag-Fox, Iowa	-	500		500	206	-		706
Grand Portage, Minnesota	-	957		957	316	-		1,273
Wett Lake, Minnesota	-	7,057		7,057	5,377	107		10,541
Red Lake, Minnesota	-	19,788		19,788	14,752	1,600		36,148
Verellian, Minnesota	-	286		286	306	186		678
White Earth, Minnesota	-	1,354		1,354	372	5		1,731
Red River, Wisconsin	-	9,221		9,221	5,051	-		14,252
La Cour Orellies, Wisconsin	-	9,909		9,909	4,710	215		14,834
La Cour Flambeau, Wisconsin	-	6,579		6,579	5,585	-		12,164
Manominee, Wisconsin	-	32,717		32,717	12,552	1,576		46,845
Total		69,363		69,363	48,167	1,897		119,427

TABLE D - BUILDING
ADDRESS WORKED BY LAND OWNERSHIP

Land Ownership	First Working				Second Working Acres	Other Working Acres	All Working Acres
	Acres Without Acreage	Acres With Acreage	Total Acres				
National Forest	50	2,444,190	2,444,240	85,575	11,869	397,622	
National Park	-	120	120	-	-	120	
Indian	-	88,363	88,363	67,107	3,697	129,172	
State and Private	2,600	2,718,710	2,721,310	663,003	83,371	3,447,684	
Total	2,650	5,161,083	5,163,733	1,195,785	94,937	3,579,456	

TABLE 2

SUMMARY OF ALL WORM EXCEPT PINE BEETLE BY STATES AND OPERATING AGENCIES, 1918 - 1945

State	Operating Agency	Hives			Number Initially Protected	Nursery Semitration			Number Still Active	Treatment	
		Boxes Destroyed	Worms Days	Boxes Destroyed		Acres Worked	Boxes Destroyed	Worms Days		Number Treated	Plants Treated
Illinois	Bureau-State	764	-	50,134	5	2,826	30,134	376	7	-	-
	Bureau-State	18	-	11,151	6	3,152	11,151	57	1	-	-
	Bureau-State	7,105	8,004	63,123	6	3,532	63,123	621	7	107	-
	Bureau-State	117,105	40,032	284,850	8	2,731	284,850	6,113	6	38,545	3,078
	Forest Service	-	-	127,873	5	1,952	127,873	10,116	1	-	-
Indiana	Bureau-State	44,152	10,032	1,112,112	13	1,635	1,112,112	10,275	7	2,006	1,000
	Bureau-State	33,225	12,041	1,320,784	17	3,004	1,320,784	3,011	9	15,191	1,111
	Bureau-State	4,417	50,751	25,321	11	5,111	25,321	1,131	4	18	-
	Bureau-State	37,051	32,137	555,625	13	3,011	555,625	4,224	9	-	-
	Forest Service	-	-	188,715	3	1,154	188,715	3,612	1	-	-
Missouri	Indian Service	-	-	200,660	1	220	200,660	337	-	-	-
	Total	31,041	36,237	2,312,201	51	4,035	2,312,201	3,211	10	-	-
All States	Bureau	283,521	116,505	2,350,825	71	27,985	2,350,825	18,929	45	53,982	10,050
	Forest Service	-	-	956,588	8	5,106	956,588	13,708	2	-	-
	Indian Service	-	-	200,660	1	220	200,660	337	-	-	-
Grand Total		283,521	116,505	3,508,073	80	33,311	3,508,073	33,034	47	53,982	10,050

ANNUAL REPORT
ON
THE CONTROL OF WHITE PINE BLISTER RUST
IN THE
SOUTHERN APPALACHIAN REGION
FOR THE
CALENDAR YEAR 1945

United States Department of Agriculture
Agricultural Research Administration
Bureau of Entomology and Plant Quarantine
Southern Appalachian Regional Office
Box #507
Room 208, Federal Building
Harrisonburg, Virginia
April 1946

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WHITE PINE BLISTER RUST CONTROL IN THE SOUTHERN APPALACHIAN REGION

ANNUAL REPORT - FOR 1945

PART I

GENERAL SUMMARY

By

J. Curtis Ball, Regional Leader

During the calendar year of 1945, cooperative white pine blister rust control was carried on in six of the nine States which make up the Southern Appalachian Region. The active States were Virginia, North Carolina, West Virginia, Kentucky, Tennessee and Georgia. Besides active States participating, we enjoyed the full cooperation of the United States Forest Service in protecting their white pine lands in Regions 7 and 8, as well as National Park Service lands in Region 1.

All control work on State and private and Forest Service Lands was administered directly by the Bureau of Entomology and Plant Quarantine. On National Park Lands control work was handled directly by the Park Service with the Bureau offering technical advice when and where needed and coordinating the work in relation to policies and procedures established by the Bureau.

TABLE I

SUMMARY OF ACCOMPLISHMENTS DURING 1945

Agency	Expenditures	Acres Ribes Free*	ACRES WORKED Ribes First	Bearing Other	Ribes Destroyed	Man- Days
Forest Service	76,611.99	195,283	3,006	24,900	1,204,933	9,952
National Park Service	2,835.97	6,286	1		141	170
E.P.Q. (Coop. work on State & Private Lands)	45,722.07	183,411	2,751	10,870	184,273	3,907
TOTAL	125,170.03	384,980	5,758	35,770	1,389,317	14,029

* Acres ribes-free represents acreage found to be naturally free of wild ribes at the time of inspection. (213,123 acres on initial survey and 171,857 acres on resurvey).

As in 1944, a good deal of our work in 1945 consisted in making white pine surveys over lands which have never before been mapped or on which no examination has been made for eight or ten years. During the early periods of control work in the region, white pine acreages for the most part were estimated by general reconnaissance with the result that our early records gave us only a vague idea as to the extent of white pine acreages and little or no information as to pine densities. Also, areas which had both white pine and wild ribes growing in association were not always accurately mapped nor clearly defined in the field. Overlapping control area boundaries also added to the confusion because it was often discovered while summarizing the old reports that acreage figures were duplicated. These errors, for the most part, have now been eliminated by dividing our control area up into mile square grids. A good deal of territory has yet to be covered on our survey work but with concentrated efforts during the next two or three years we should complete the job.

In 1945 a total of 1,441 full or partial grids were surveyed, including 635,330* acres incorporating 279,133 acres of white pine. Over 90 percent of the control acreage worked has been found to be free of wild ribes. A total of 5,496 man-days were expended on survey work. The average coverage was 116 acres per man-day.

Because of an unusually early spring we were able to get off to a good start on ribes eradication with 1,389,317 ribes being destroyed on 41,528 acres of ribes-bearing lands. Because of the difficulty in keeping eradication data by land ownership where the crews are operating on intermingled lands, it is now the policy to record such data by operating agencies as shown in Table I and in other tables throughout this report.

In recording progress of control by land ownership, only acreage figures are used since this is a tangible factor and can be determined directly from maps or by field examination.

During the period following the war the labor situation gradually improved and by the end of the year we had 80 percent more applications for work than we had in 1944. What we needed most were more young men to do checking and survey work who can perform the necessary physical labor involved as well as be able to properly record and summarize the data obtained thus relieving the field supervisors of a lot of detailed paper work which they have been obliged to do. This type of man is still hard to get in the mountainous sections of our region but it is hoped that by next spring there will be enough World War II veterans returning who can fill the bill.

- * Of this acreage, actually only 334,980 acres were classified as ribes-free. On the remaining 290,350 acres some post checks will have to be run in 1946 to determine the status of ribes eradication. It is expected that much of this remaining acreage will be eliminated from the control area or if retained, classed as ribes-free.

As to the present status of control in the region (See Table II) we will not be down to definite figures until our resurvey work is completed and all ribes-bearing and ribes-free areas delimited. As it now stands, our acreage figures represent the true surveyed grid figures as well as old estimated figures on lands which have not yet been surveyed on the grid system. Thus, at this time it is difficult to say that our control acreage and white pine acreage will ultimately be anywhere near the same as originally estimated. In Georgia where the grid survey is now about complete, a fairly good comparison can be made between the original estimate and the actual grid survey. In 1938 the total control acreage for Georgia stood at 758,000 acres which included 400,000 acres of white pine worth protecting. During the late fall of 1938 the grid survey was started in Georgia and except for a small section in one County has now been completed over all the white pine growing lands in the northern portion of the State. As of December 31, 1945, we have surveyed a total of 673,733 control acres incorporating 549,047 acres of white pine. As to control acres, we can see that the 1938 estimate is greater by 11 percent than the actual grid survey figures and the increase in acreage of white pine is greater, being over 27 percent. This situation is very similar in other States; namely, that the white pine acreage shows an increase but the control acreage changes only slightly, either being greater or smaller than the original estimates.

There are exceptions, of course, where obvious errors later turned up in the old records, such as claiming the same acreage twice or failure to delimit overlapping control area boundaries.

TABLE II

STATUS OF CONTROL BY LAND OWNERSHIP, 1932 TO 1945, INCLUSIVE

Ownership	Acres White Pine	Acres Control	Acres Worked			Acres on Main- tenance	Acres Remain- ing to work
			Initial *	Other	Total		
Forest Service	875,811	1,508,106	1,478,759	66,275	1,545,034	1,362,774	29,347
Park Service	61,616	122,974	120,149	8,805	128,954	106,410	2,825
Indian Service	22	445	445		445	445	
State & Private	2,015,627	4,675,050	4,613,639	159,541	4,773,180	4,301,824	61,411
TOTAL	2,953,076	6,306,575	6,212,992	234,621	6,447,613	5,771,453	93,583

* Includes 5,598,014 acres ribes-free and 614,978 acres ribes-bearing.

Although active control work was performed in only six states in the region, some general reconnaissance work was performed in Delaware by Assistant Area Leader, H. B. Teague, in cooperation with the State Entomologist, Mr. Hopperstead. The work in the State was confined mainly to scouting for rust on white pine and ribes. Infection was found on cultivated ribes but none on white pine. For details see the Delaware report (pages 33 - 36) prepared by Mr. H. E. Yost.

Except for some general checking work, performed by Area Leader Yost and the Regional Leader, no active control work was performed in the State of Maryland. It is hoped that a project will be started in this State during 1946.

Work plans have been made up by Area Leader Welton to start resurvey work in South Carolina early in 1946.

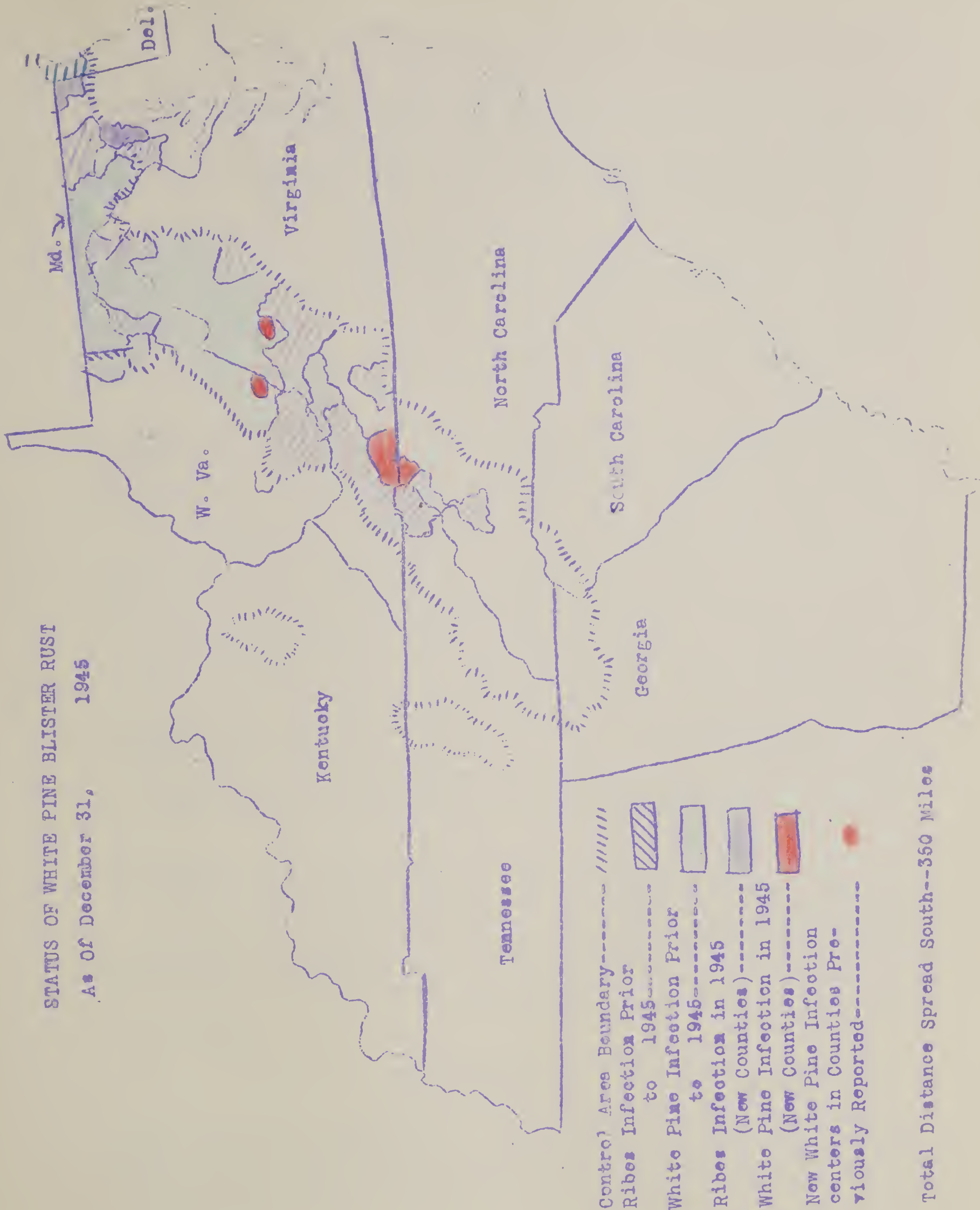
In the spring of 1945 a resurvey project was started in the Cumberland National Forest in Kentucky using Forest Service blister rust funds transferred from the Cherokee National Forest project in Tennessee. For the fiscal year 1946 no Forest Service funds were available so some funds allotted for work on intermingled lands were used to continue the operation. Good progress has been made on this project.

In the early spring of 1945 operations were resumed in North Carolina with surveys being started in Ashe County. In the fall another operation was started in the southwestern portion of the State in Macon County. The big job in North Carolina will be to complete the resurvey on the grid system of all white pine lands in the State.

An early warm spell in March caused exceptionally early fruiting of cankers on diseased white pines. At the same time ribes were also coming out in leaf and for awhile it appeared that we may have another general spread of rust throughout the region as was witnessed in 1941. However, the weather again turned cold, followed by heavy frosts which caused the early ribes leaves to drop. By the time a new crop of leaves were formed aecia production was nearly over. Nevertheless, in certain sections ribes infections were fairly heavy but outside of two new infections found in cultivated ribes in Maryland, in Cecil and Anne Arundel Counties, the spread on ribes was rather light. On the other hand, white pine infections were discovered for the first time in southwestern Virginia in Grayson County and in Ashe County, North Carolina. The Ashe County infection was the first pine infection reported for North Carolina. It was discovered on a small three acre pine lot which had never been protected. The earliest canker dates back to 1936. Other new small centers of infection were also found in counties previously reported. One of these was along the Blue Ridge Parkway in Virginia. The map on page 5 gives the status of the spread of blister rust as of December 31, 1945.

STATUS OF WHITE PINE BLISTER RUST

As Of December 31, 1945



PART II

Leadership, Coordination and Technical Direction of Blister Rust Control

By The
Bureau of Entomology and Plant Quarantine

Work Project BLR 1-2

By
J. Curtis Ball, Regional Leader

OBJECTIVES

The Bureau of Entomology and Plant Quarantine is responsible for leadership, coordination and technical direction of Blister Rust Control. By leadership we mean the assignment of responsible persons to formulate definite work plans and to see that they are carried out in the field in the most efficient manner. The first phase of leadership is planning the job ahead. The second phase is the proper management of the plans after they are in operation and the ability to change plans quickly and effectively under changing conditions. The coordination of the work is a part of the planning program so that the various factors involved may be brought together to operate as an integrated cooperative project. This is especially important when several different agencies are performing the same type of work and on different lands. In order to maintain proper coordination it is necessary that technical direction be maintained at all times to see that policies promulgated in the management plan be adhered to. If this is not done the coordination of the program soon breaks down. To keep good coordination it is necessary that favorable relations always be maintained with all cooperating agencies as well as within the Bureau organization itself.

In the Southern Appalachian Region it has been our aim to carry out these ideals and the results have been more than favorable. At the present time, our management plan is being altered to take into consideration a long time maintenance program. To place our region on a maintenance basis as soon as possible is our main objective but the goal could never be effectively reached without coordinating the blister rust control work of the various agencies concerned.

ORGANIZATION

Since 1943 we have been operating on an area basis with the Region divided into two large areas each under the leadership of an Area Leader. The States of Delaware, Maryland, Virginia and North Carolina are designated as Area I and the States of West Virginia, Kentucky, Tennessee,

Georgia and South Carolina as Area II. Each Area Leader has an Assistant Area Leader and several field supervisors under his direct supervision.

As our region enters into a full maintenance program, our organization out of necessity will become more centralized which will mean that the separate areas will not maintain their status quo but will be expected to operate more as one large control unit. The reason for this will be due to the fact that after all our survey work is completed the area remaining to be maintained for active ribes eradication will be only small sections of the total control area with many such sections overlapping into both areas which for the most part are divided by natural boundaries. Thus, one field supervisor can more efficiently handle the supervisory work in one section bordering two states in different areas than keeping the work segregated by areas as it is now. Whereas, we are now operating the year 'round, we will only conduct seasonal work when on full maintenance.

Below is a list of the personnel employed in the region during the 1945 calendar year.

PERSONNEL

ASSIGNMENT

1. REGIONAL OFFICE, HARRISONBURG, VIRGINIA

J. Curtis Ball, P-4	Regional Leader
John R. George, CAF-9	Administrative Assistant
Mrs. Ellen G. Fischer, CAF-4	Clerk Stenographer, Transferred to R.C.F., February 7, 1945
Miss Emily M. Lonergan, CAF-4	Clerk Stenographer, L/A Appointment 3/12/45, Appointed 3/16/45
Miss Mary B. Mitchell, CAF-4	Clerk Stenographer, Appointed 2/16/45
Miss B. Frances Gardner, CAF-5	Clerk Stenographer, Appointed 10/8/45
Mrs. June F. Garber, CAF-2	Clerk Typist, Appointed 2/16/45

2. FIELD AREA I

Henry E. Yost, P-3	Area Leader, Harrisonburg, Va. Delaware, Maryland, Virginia and North Carolina
Hillary B. Teague, P-2	Asst. Area Leader, Wytheville, Va.
George C. Cramer, SP-6	Field Supervisor, Mt. Solon, Va.

PERSONNEL

ASSIGNMENT

Henry G. Simmons, SP-5	Field Supervisor, L/A Appointment Monterey, Virginia
Irvin L. Stringer, SP-5	Field Supervisor, Appointed 12/3/45 Galax, Virginia
James R. Tomlinson, SP-5	Field Supervisor, Appointed 12/3/45 Boone, North Carolina
Charles A. Rodamer, SP-5	Field Supervisor, L/A Appointment 10/22/45, Hot Springs, Va.
Martin Q. Miller, SP-5	Field Supervisor, Mt. Solon, Va. Paid by State of Virginia Funds
Mrs. Roxie R. MacKenzie, CA -3	Clerk Stenographer, Harrisonburg Va.
Miss Joyce L. Cramer, CAF-2	Clerk Typist, Mt. Solon, Virginia
Mrs. Irene H. Foust, CAF-2	Clerk Typist, L/A Appointment 3/12/45 Appointed 4/13/45, Wytheville, Virginia
Miss Audrey M. Jenkins, CAF-2 Intermittent	Clerk, Terminated 9/26/45. Has been on State Funds, Harrisonburg, Va.
Miss Vada M. Prader	Clerk, Paid from State of Virginia funds, Wytheville, Virginia
Miss Audrey Bell, CAF-2 Intermittent	Aerial Survey, Terminated 5/14/45. Richmond, Virginia. Now paid from State of Virginia funds

3. FIELD AREA II

Ralph W. Welch, P-3	Area Leader, Harrisonburg, Va. West Virginia, Kentucky, Georgia, Tennessee and South Carolina
William V. Zimmer, P-2	Assistant Area Leader, Danlonega, Ga.
George C. Hamilton, SP-6	Field Supervisor, Petersburg, W.Va.
Glenden E. Keaton, SP-5	Field Supervisor, Beekley, W. Va. Resigned 1/23/45, Reappointed 8/27/45

PERSONNEL

ASSIGNMENT

Delbert L. Gillispie, SP-5

Field Supervisor, Marlinton, W.Va.

Fred W. Hall, SP-5

Field Supervisor, Filijay, Ga.

Edward L. New, SP-3

Field Supervisor, Appointed by State of Tennessee, Frankfort, Tenn.

Miss Jane C. Moore, CAF-3

Clerk Stenographer, Marlinton, W.Va. Reclassified CAF-2, Clerk-Typist 10/8/45.

Miss Margaret L. Simmons, CAF-3

Clerk Stenographer, Appointed 2/1/46, Danlonega, Georgia

4. CONTROL METHODS AND INVESTIGATIONS

P. L. Rusden, P-3

In Charge of Methods and Investigations - Eastern Regions. Cambridge, Mass.

H. F. Yost, P-2

Harrisonburg, Virginia

CONTROL WORK PERFORMED IN 1945

Ribes Eradication

An early spring enabled our crews to start ribes eradication from two to three weeks earlier than usual, with the result that we had a long eradication season which was not terminated until early in November. The largest eradication job was on the George Washington National Forest in Virginia and West Virginia where Forest Service and Bureau crews working on intermingled lands eradicated 843,650 ribes on 20,451 acres. The bushes pulled on this project amounted to 61 percent of the total bushes destroyed in the Region. Ribes eradication was also performed on the Jefferson National Forest in Virginia, the Monongahela National Forest in West Virginia, the Cumberland National Forest in Kentucky and the Chattahoochee National Forest in Georgia. A small amount of work was also performed by the National Park Service on the Shenandoah National Park in Virginia and the Great Smoky Mountains National Park in North Carolina and Tennessee. The resurvey on the Shenandoah National Park has progressed very well under the supervision of Forester Moore. On the Great Smoky Mountains National Park, Forester Savage undertook the revision of the grid system on the park, whereas the entire Park is now on one system. The original system was broken up into separate County systems. This will not cause any confusion in our records since

the only county involved in our original grid survey is Haywood County and the new Park system is nothing more than an extension of the Haywood grid system. Forester Savage plans to make a complete white pine and ribes survey of the entire Park.

Ribes eradication on State and private lands progressed satisfactorily. However, since most of our ribes eradication was on State and private lands or intermingled with Federal holdings the work was performed by both Forest Service and cooperative crews as an integrated project in order that all lands will be adequately protected. No attempt, of course, has been made to segregate ribes pulled and man-days by land ownership. Only acres worked have been segregated by land ownership.

In the Cumberland Mountains of Tennessee, ribes eradication on State and private lands continued throughout the season in Morgan and Cumberland Counties. This is all second eradication and in some places the regeneration after a period of seven years was rather heavy, while in others it was comparatively light. In the Cumberland plateau, ribes (R. cynospati) are confined to the comparatively steep and rocky drainages in association with the best white pine. On the plateau proper, one finds mainly scrub oak. Repeated forest fires in this section have been very detrimental to forest growth and regeneration. South of Morgan County, R. curvatum species become dominant. R. curvatum is more tolerant of dry exposed sites and one finds the species often growing out in the open plateau.

Detailed reports of blister rust activities on State and private as well as on Federal lands are found in Parts IV, V and VI of this report.

TABLE I

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES - 1945

STATE	OPERATING AGENCY	INITIAL ACRES RIBES-FREE	ACRES WORKED (Ribes-Bearing Lands)				RIBES DESTROYED	ADDITIONAL DAYS
			INITIAL WORK	SECOND WORKING	OTHER WORKINGS	TOTAL		
Virginia	Bureau	41,495	1,545	3,349	208	5,153	36,185	1,167
	Forest Service		1,306	17,612	2,494	21,412	1,014,823	5,248
	Park Service	1,113						60
	Total	42,608	2,852	20,964	2,752	26,568	1,101,008	7,475
North Carolina	Bureau	33,257	1,205	593	669	2,467	24,624	450
	Park Service		1			1	141	2
	Total	33,257	1,206	593	669	2,468	24,765	452
TOTAL AREA I	Bureau	74,752	2,751	3,942	927	7,620	110,809	1,372
	Forest Service		1,306	17,615	2,494	21,415	1,014,823	5,248
	Park Service	1,113	1			1	141	2
	Total	75,865	4,058	21,557	3,421	29,036	1,123,775	6,622
West Virginia	Bureau			4,963		4,963	48,245	220
	Forest Service	4,335	1,700	4,791		6,491	190,080	1,160
	Total	4,335	1,700	9,754		11,454	238,325	1,380
	Bureau			55		55	749	20
Kentucky	Bureau			839		839	11,833	580
Tennessee	Bureau				134	134	12,637	280
Georgia	Bureau	33,593						1,000
	Forest Service	99,330						1,517
	Total	132,923				134	12,637	1,517
	Bureau	33,593		5,867	134	6,001	73,464	1,407
TOTAL SOUTHERN APPAL. REGION	Forest Service	103,665	1,700	4,791		6,491	190,080	5,368
	Total	137,258	1,700	10,658	134	12,492	263,544	6,775
	Bureau	100,515	2,752	3,000	2,001	7,753	184,213	3,401
	Forest Service	103,665	3,006	22,406	2,494	27,906	1,204,903	5,368
	Park Service	1,113	1			1	141	2
GRAND TOTAL		213,123	6,768	32,214	3,555	43,528	1,389,317	18,819

TABLE II

SUMMARY OF RIBES ERADICATION BY FOREST SERVICE IN 1945

NATIONAL FORESTS	INITIAL ACRES RIBES-FREE	ACRES WORKED ON RIBES BEARING LANDS				MAN-DAYS			RIBES ERADICATED		
		Initial Work	Second Working	Other Workings	Total	First Working	Re- Work	Total	First Working	Re- Work	Total
Geo. Washington	320	1,034	16,923	2,494	20,451	805	5,027	5,832	139,589	704,061	843,650
Jefferson		472	4,254		4,726	524	1,089	1,613	72,294	188,584	260,878
Monongahela	4,015	1,500	1,229		2,729	298	198	496	87,610	12,765	100,375
Cumberland				(Re-survey only)							
SUB TOTAL											
F.S. REGION #7	4,335	3,006	22,406	2,494	27,906	1,627	6,314	7,941	299,493	905,410	1,204,903
Nantahala				(Re-survey only)							
Chattahoochee	99,330					1,015		1,015			
SUB TOTAL											
F.S. REGION #8	99,330					1,015		1,015			
TOTAL NATIONAL FORESTS	103,665	3,006	22,406	2,494	27,906	2,642	6,314	8,956	299,493	905,410	1,204,903

TABLE III

SUMMARY OF RIBES ERADICATION BY NATIONAL PARK SERVICE IN 1945

NATIONAL PARKS	INITIAL ACRES RIBES-FREE	ACRES WORKED ON RIBES BEARING LANDS				MAN-DAYS			RIBES ERADICATED		
		Initial Work	Second Working	Other Workings	Total	First Working	Re- Work	Total	First Working	Re- Work	Total
Shenandoah N. Park	1,113					50		50			
Blue Ridge Parkway											
Great Smoky Mts.		1			1	2		2	141		141
TOTAL NATIONAL PARKS	1,113	1			1	52		52	141		141

TABLE IV

ACRES WORKED BY LAND OWNERSHIP IN 1945

O W N E R S H I P	A C R E S W O R K E D					TOTAL. (All Workings)
	Initial Work		Second Working	Other Workings		
	Acres Ribes-Free	Acres With Ribes	Acres With Ribes	Acres With Ribes		
Forest Service, Region #7	16,194	2,545	19,758	2,315		40,812
Forest Service, Region #8	99,330					99,330
SUB-TOTAL, Forest Service	115,524	2,545	19,758	2,315		140,142
Park Service, Region #1	1,113	1				1,114
SUB-TOTAL, Federal Lands	116,637	2,546	19,758	2,315		141,256
State & Private Lands, Area #1	61,888	2,797	5,224	1,106		71,015
State & Private Lands, Area #2	34,598	415	7,233	134		42,380
SUB-TOTAL, State & Private Lands	96,486	3,212	12,457	1,240		113,395
REGIONAL TOTALS	213,123	5,758	32,216	3,555		254,651

TABLE V
SUMMARY OF EXPENDITURES ON RIBES ERADICATION IN 1946

STATE	BUREAU (Leadership & Coordination)	BUREAU COOPERATION	STATE - COOPERATIVE (Direct Aid Only)	NATIONAL FOREST SERVICE	NATIONAL PARK SERVICE	TOTAL FUNDS EXPENDED
Delaware		72.05	302.67			374.72
Maryland	9.69					9.69
Virginia	9,293.42	11,604.93	5,668.52	45,667.56	1,502.35	73,736.78
N. Carolina	86.87	6,281.04	2,227.21		1,333.62	9,928.74
W. Virginia	6,501.60	7,020.46	3,069.10	19,561.32		36,152.48
Kentucky	7.64	1,613.68		846.60		2,467.92
Tennessee	152.18	2,063.03	2,206.02			4,426.23
S. Carolina	3.18					3.18
Georgia	5,354.67	2,139.22	1,449.14	10,536.51		19,479.54
TOTAL	21,409.25	30,739.41	14,922.66	76,611.99	2,835.97	146,579.20

* Indirect aid on the part of the various States was valued at \$3,271.66, which brings this total amount expended (cash and contributed services) to \$18,194.32.

OTHER ACTIVITIES PERFORMED IN 1945

White Pine Surveys

White pine surveys were conducted throughout the year in the States of Virginia, North Carolina, West Virginia, Kentucky and Georgia. Although some preeradication survey work was performed, most of it was resurvey on lands initially covered some seven to ten years ago. Our aim is to complete the resurvey work in the entire region on the mile square grid basis within the next two or three years.

Along the eastern slopes of the Blue Ridge range in Virginia and North Carolina the white pine has been gradually creeping down into the lower elevations and in a few sections is invading the Piedmont foothills. Also, in the Central Appalachians, west of the main Alleghany range, enough white pine has been observed through general reconnaissance to warrant some detailed mapping. Most of this white pine falls in the north central portion of West Virginia. Thus, it appears that after our survey is completed our present control boundary will expand somewhat on the east and the west.

Much of the acreage surveyed during the late winter months will not be classified until post checks are performed in the spring of 1946. Any area which seems at all doubtful as to the presence of wild ribes is not classed as worked until such post checks are made.

Even though much of our acreage surveyed and found to be ribes-free is on lands previously covered, we are listing such block-out lands under initial work. This is much less confusing than to try and segregate ribes-free areas by first, second and other workings. This was attempted in the past with the result that we were gradually losing sight of the real problem at hand - which is, the actual ribes-bearing lands. Thus, our work in determining ribes-free lands is more or less being handled as a special project, whereas we are segregating our ribes-free lands from the ribes-bearing and classifying the former as initial coverage. This is only logical since it is hard for anyone to conceive of ribes-free land being classed as worked under ribes eradication more than one time. In former years ribes-free and ribes-bearing lands were all thrown together as worked acres. This was not only confusing but gave us ridiculous figures as to per acre figures for ribes, man-days and costs. By segregating our ribes-bearing lands from ribes-free lands we now can show per acre figures which are comparable with the other regions.

Besides our regular grid mapping, a good deal of reconnaissance work was performed in the State of Georgia. Through reconnaissance a large acreage has been eliminated from the control area.

TABLE VI

TOTAL ACRES SURVEYED AND ACRES CLASSED AS BLOCK-OUT IN 1945

STATE	Total White Pine Mapped	Total Acres Mapped	Acres* Block Out	Total Man- Days	Acres Cov- ered Per Man-Day
Virginia	92,204	249,447	101,664	2,010	124.1
North Carolina	16,961	74,050	62,750	496	149.3
West Virginia	43,476	128,100	40,988	1,268	101.0
Kentucky	20,031	44,800	44,735	201	222.9
Tennessee	2,000	4,739	1,920	98	48.4
Georgia	104,561	134,194	132,923	1,423	94.3
REGIONAL TOTALS	279,233	635,330	384,980	5,496	115.6

* Includes 213,123 Acres blocked out on initial work and 171,857 acres on resurvey.

Checking

More and more attention has been given to running systematic strip checks to determine the effectiveness of current ribes eradication as well as to determine the status of control on areas worked several years ago.

Check strips are run in cardinal directions and tied into grid lines or other designated base lines. Checking tags are used, which designate the type of check run, location and direction of strip. Tags are placed at all road and trail crossings and on grid lines. The percentage of check made varies between $2\frac{1}{2}$ to 5%, depending on field conditions and ribes distribution.

Because wild ribes are often confined to rocky hollows, it is often necessary that the checkers make off strip checks when their regular strip parallels such hollows.

TABLE VII

SUMMARY OF CHECKING IN 1945

TYPE OF CHECK											
Advance			Post			Regular			All Checks		
Strip	A. Cov-	Man-	Strip	A. Cov-	Man-	Strip	A. Cov-	Man-	Strip	A. Cov-	Man-
Acres	ered	Days	Acres	ered	Days	Acres	ered	Days	Acres	ered	Days
357.9	8,849	164	3757.8	130,346	1211	1339.9	29,606	332	5455.6	168,801	1707

The percent check run varied according to field conditions encountered. On post checking it was often found that only a 2-1/2 percent check was necessary while in other cases a 5 percent check was made. The average for the region was 2.3 percent. Regular checks for the most part were on a full 5 percent basis, the average for the region being 4.5 percent.

Strip acres covered per man day averaged 3.2.

Nursery Sanitation

The oldest ribes eradication job in the Southern Appalachian Region is on the Forest Service Nursery at Parsons, West Virginia. Work on this nursery was started by Mr. Roy G. Pierce in 1928 and ribes eradication has continued nearly every year since that date. Mr. A. A. Wood, Supervisor of the Monongahela National Forest has a great deal of interest in this nursery and has urged that ribes be held down to the minimum. During the war very little white pine was grown at the nursery and in 1944 no blister rust control work was performed. In 1945 the entire nursery and the surrounding 1,500 foot control zone was completely covered by our eradication crew with 94 ribes being pulled on 641 acres with 17 man-days being used on the project.

During the years that work has been performed on the Parsons Nursery, 32,078 ribes have been eradicated.

Outside of the Parsons Nursery no other nursery sanitation work was performed during 1945.

Canker Elimination

During the year no special canker elimination project was performed in the region. In southwestern Virginia Mr. H. E. Yost, with the assistance of Mr. H. B. Teague, made a preliminary study of a new white pine infection center near Comers Rock. During the course of examination all visible branch cankers were removed and tabulated as to year of origin and stage of infection.

TABLE VIII

SUMMARY OF CANKER ELIMINATION IN CONNECTION WITH
COMERS ROCK INFECTION STUDY

: Number	:No. Cankers by Years:	Number:	Avg. #Can-	Number	:Number	:Est. Ft.	:
: Trees	:	: Cankers:	:kers per	: Trees	: Ribes	:Livestem:	:
:Infected:	1941: '42 : '43:Tot.:	:Fruited:	:Infected	:Examined:	:round :	: in :	:
:	: : : : :	: in 1945:	:Tree	:	:on area:	:Bushes :	:
:	:	:	:	:	:	:	:
: 21	: 1 : 354: 306: 661:	: 13	: 31	: 56	: 4	: 900	:
:	: : : : :	:	:	:	:	:	:

Of the 661 branch cankers found, 654 were cut from 25 trees within a radius of 66 feet of one large ribes bush containing 350 feet of live stem.

Field Studies

During the last two weeks in May, Dr. P. L. Rusden, Pathologist from the Cambridge Office, made a field trip through the Southern Appalachian Region with Area Leader Yost. A number of ribes regeneration pine infection plots were examined. After completing the trip, Rusden and Yost reviewed all study plot data with the result that a number of regeneration plots were excluded from future study because it was felt that any additional information obtained would have little value. It was recommended that we continue the study on the pine infection study started by Mr. Welch in West Virginia, which study revealed the spread of rust to pines from a single ribes bush. Also, several studies are to be continued in western Maryland, which were started by Mr. Yost several years ago.

Since we have ample data on ribes regeneration we plan to direct our attention in 1946 to making a detailed disease survey. Definite and final plans have as yet not been made for conducting this survey, but in general we will use the strip sampling method recording infected trees by one chain transects. The strips will be spaced so as to give us a definite percentage of the area sampled. We will probably radiate the strips from known infection centers and take pine counts as long as infection is found. If properly conducted, the data obtained from such a survey should furnish us with information as to the approximate percentage of infection, the extent of infection and the intensity of build up.

Another problem which confronts us is an ecological one pertaining to the peculiar distribution of wild ribes throughout the Southern Appalachians. No explanation has as yet been given as to why ribes are found in abundance at one location and none found at other locations with such factors as elevation, exposure, moisture, etc., being apparently the same. In order to determine whether some of these so called ribes-free sites have always been free of ribes we plan to obtain several duff samples to send to the Berkeley, California station to determine whether any viable ribes seeds are present.

WHITE PINE LUMBER PRODUCTION

According to figures received on lumber production in the Southern Appalachians the white pine lumber production for the year 1945 was 138,094 M-board feet. This is 22,888 M-board feet less than was produced in 1944.

TABLE IX

ESTIMATED PRODUCTION OF WHITE PINE LUMBER IN M-BOARD FEET
IN THE SOUTHERN APPALACHIAN HARDWOOD REGION FOR THE YEARS
1942, 1943, 1944 and 1945

STATE	M-BOARD FOOT PRODUCTION BY YEARS					
	1942	1943	1944	1945	Total	
Virginia	16,903	31,794	45,624	38,227	132,548	
West Virginia	4,447	17,357	12,231	15,755	49,790	
North Carolina	37,843	59,904	74,866	62,667	235,280	
South Carolina	1,938	1,085	1,628	946	5,597	
Kentucky	2,199	2,541	6,573	2,170	13,483	
Tennessee	14,948	8,959	17,644	16,292	57,963	
Maryland	294	1,296	426	331	2,347	
Georgia *	5,000	1,705	1,870	1,706	10,281	
TOTAL	83,572	124,641	160,932	138,094	507,289	

Data from Alleghany and Southern Appalachian Forest Experiment Stations and other sources.

* Incomplete data for Georgia.

Although the production of white pine lumber in the Southern Appalachians is only a small percent of the total lumber production, it nevertheless represents an important factor since the presence of white pine in a mixed stand of hardwoods is often the deciding point as to whether a timber sale is made or not.

Amount and Value of White Pine

It has been estimated that there is 1,921,000 M.B. feet of white pine in the Southern Appalachians valued at \$19,000,000 on the stump and an F.O.B. mill value of \$58,000,000. Stumpage values varied greatly throughout the region during 1944, ranging between \$8.00 to \$25.00 per M.B. feet with an average range close to \$10.00 per thousand. Values F.O.B. mill ranged from \$20.00 to \$40.00 or more per thousand with an average price of \$30.00. These average values probably did not change a great deal in 1945.

In order to place a value on immature growth up to 8" D.B.H. is quite difficult, especially when you are dealing with mixed stands. In figuring such values on a per acre basis various factors have to be considered. Thus, on National Park lands the value placed on white pine per acre for immature growth is much higher than can be figured on National Forest Lands or on private lands. By consulting Forest Service and Park Service officials an average value per acre on Forest Service and private lands was placed at \$5.00 per acre while on Park lands the average value was \$18.00. By applying these values it is estimated that the value for immature white pine in the region is about \$11,400,000, based on 640,000 acres of white pine on National Forest lands; 1,500,000 acres on private lands and 37,000 acres on Department of Interior lands.

On National Park lands the esthetic value, as well as the commercial value, is taken into account while on National Forest and private lands only the commercial value is considered. Purely ornamental pines are not taken into consideration since in this case no specific value can be set.

STATUS AND SUMMARY OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31, 1945

As of December 31, 1945, we find that 6,624,001 acres have been worked in the region. Of this total 6,292,462 acres were initially covered, 290,612 acres worked a second time and 40,928 acres worked three or more times. A total of 34,018,585 ribes have been destroyed on 946,517 acres of ribes-bearing lands. A total of 315,084 man-days have been expended on ribes eradication. Acreage placed on maintenance amounts to 5,771,453 acres or 87 percent of the total control acreage.

All above figures, except the acreage shown on maintenance, are gross figures. By gross figures we mean all work conducted in the region during the last 13 years. During the course of our grid survey we have been adjusting the gross figures and have eliminated large acreages from the control area because of obvious errors in the early records but have retained such acreage where work was actually performed but has now been eliminated from the next control acreage because certain areas are not worthy of further protection for reasons that the pine has been burned off, logged off and for various other factors involved. Table XI shows the status of the present net acreage figures for the region which represents the active acreage which must be maintained.

A large portion of the acreage reported as worked is taken from the original estimated figures. Hence, numerous adjustments will have to be made until our resurvey by the grid system is completed. In Virginia the old

eradication records were so incomplete that it has often been impossible to segregate the different workings. Also on many of the old areas white pine acreage has increased to such an extent within the last eight or ten years that there now is no indication whatever as to the exact boundaries of the original control areas. The early failure to definitely designate the exact location of ribes-bearing areas has also been very confusing in Virginia. Not only was the location misleading but also the acreage. All this confusion will, of course, be cleared up on the completion of the resurvey. In the meantime we will have to do the best we can in segregating ribes eradication by workings. Although the situation in North Carolina is better, with respect to ribes-bearing areas, we still are using total control and white pine acreage figures, which are of doubtful reliability. This situation will also be cleared up through resurvey which is now underway both in the southwestern and northern portions of the state.

In the 1944 Annual Report it was recommended that white pine resurveys be conducted on three National Forests which have had no work performed on them for the last eight or ten years. These recommendations are now being carried out or plans have been formulated for carrying them out. In the Spring of 1945, a small amount of Forest Service District funds were transferred from the Cherokee National Forest in Tennessee to start a survey on the Cumberland National Forest in Kentucky. The work was conducted during the last half of 1945 using \$105 funds allotted for work on intermingled lands. In North Carolina, \$105 funds have been used to start survey work on intermingled lands within the Nantahala National Forest. Also, a small amount of funds for work on intermingled lands have been held out to start a resurvey on the Sumter National Forest in South Carolina. It is expected that this work will get underway by March of 1946. Work on the Chattahoochee National Forest in Georgia will be completed probably by the end of February. Unused funds allotted to the Chattahoochee will be transferred to continue work on the Nantahala and Sumter Forests. It is estimated that approximately \$7,000 will be available for transfer. On the Monongahela National Forest the resurvey is near completion as well as ribes eradication. This forest will be on complete maintenance within a very short time. Work has progressed satisfactorily on the George Washington and Jefferson National Forests and it is expected that the grid survey on these two forests will be completed within the next two years. The Cherokee National Forest in Tennessee is on maintenance, although it is contemplated to perform some post checks on the Unaka and Watauga Districts in 1946. A good deal of the original acreage worked on the Cherokee has been eliminated from the control records because of the distance of some of the old ribes areas from white pine. It is expected that more acreage will be eliminated after the 1946 post checks. On the Pisgah National Forest in North Carolina, some more resurvey and post checking is now needed. It is proposed that some post checking be done on this forest in 1946.

During the last two years a small amount of control work has been performed on National Park lands in the region. On the Shenandoah National Park in Virginia, Forester Robert Moore has been concentrating on resurveying all of the old pine area on the Park. He hopes to have the work completed early in 1946. Ribes eradication, checking and survey work has been performed by Civilian Public Service labor and regular employees during the past three years. The C.P.S. camps will probably be disbanded by June 30, 1946, after which the Park Service will have to depend on local labor. It was found advisable by Park Forester Savage to make a complete resurvey of the Great Smoky Mountains National Park in Tennessee and North Carolina. The grid index system has been completely revised for the Park, whereas it is now on one grid system instead of being broken up by separate county systems as originally laid out. The Blue Ridge Parkway, which will eventually be a connecting link between the Shenandoah National Park and the Great Smoky Mountains Park is long and narrow. For this reason it is impossible to make up a separate grid survey system for the Parkway. Along the Parkway very few wild ribes areas have been found in association with white pine and most of these lie in the section north of Roanoke, Virginia.

Outside of work on intermingled lands within the National Forest purchase units, efforts are being made to push the survey on State and private lands to completion as soon as possible. Some of our best white pine is on private lands, with a large percentage being ribes-free. The difficulty of making accurate surveys on private lands is due to the intermingling of cultivated fields, pasture fields and woodlots. The use of aerial photographs, and woodland overlay planimetric maps have been our greatest aid in surveying these lands. The status of lands under private ownership also changes rather rapidly. There are indications that each year the acreage being cleared for crops and pasture is decreasing while woodland acreage is on the increase. When land was first cleared for the growing of crops very little consideration was given to soil and site conditions with the result that large acreages were cleared of timber which was soon found unsuitable for growing annual crops or maintaining good pasture land. Many of these old cleared lands are again reverting to woods. Some are coming back to brush and inferior timber but in many cases we are finding good stands of young white pine which, if properly managed, will provide the landowners with a good cash crop at maturity.

TABLE X

SUMMARY OF RIBES ERADICATION 1928 - 1945, INCLUSIVE

State	Operating Agency	Acres Ribes Proc	ACRES WORKED - (RIBES-BEARING)			Total Acres Worked	Man-Days On Ribes Eradication	Total Ribes Eradicated	PER ACRE	
			Initial	Second Working	Other Working				Man-Days	Per Acre
Delaware	Bureau	4,682				4,682	268	4,113*	.06	6.9
Maryland	Bureau	139,808	36,500	38,534	19,853	234,695	22,347	3,792,402	.09	16.3
Virginia	Bureau	683,701	202,961	48,246	12,443	947,351	72,419	7,389,938	.08	7.8
	For. Serv.	163,587	39,409	9,646	2,488	215,110	6,181	1,003,645	.03	1.1
	Park Serv.	9,786	10,875	10,101	2,328	33,090	20,319	1,828,134	.61	55.6
	Bureau	1,618,247	15,619	8,664	1,970	1,644,500	54,605	2,627,070	.03	1.1
North Carolina	For. Serv.	48,512	1,285	419	1,375	51,591	1,287	62,711	.02	1.3
	Park Serv.	16,072	527	326	72	16,997	573	27,961	.03	1.6
West Virginia	Bureau	529,445	259,821	70,339		859,615	56,015	6,790,964	.07	7.9
	For. Serv.	25,683	12,941	21,181		60,805	9,691	599,966	.16	1.3
Kentucky	Bureau	80,500	55	66		80,630	847	4,690	.01	0.6
	For. Serv.		(Reserve, only)							
Tennessee	Bureau	1,117,428	29,257	56,891		1,203,576	35,353	4,332,570	.03	3.1
	For. Serv.	538,158	3,235	24,089		565,482	11,656	1,990,623	.02	3.4
South Carolina	Bureau	29,635				29,635	1,427	7,487*	.05	0.7
Georgia	Bureau	437,536	1,963	1,895	399	441,793	18,994	3,540,930	.04	8.0
	For. Serv.	233,714	520	215		234,449	3,092	14,376	.01	0.6
TOTALS SOUTHERN APPALACHIAN REGION	Bureau	4,640,992	546,186	224,634	34,665	5,446,477	262,275	28,490,164	.05	6.4
	For. Serv.	1,010,634	57,590	55,550	3,863	1,127,437	31,917	3,671,326	.03	3.3
	Park Serv.	25,858	11,402	10,427	2,400	50,087	20,392	1,357,095	.41	27.7
	ALL AGENCIES	5,077,484	614,978	290,611	40,928	6,624,001	315,084	34,018,585	.05	6.4

* Cultivated Ribes Only

TABLE XI

STATUS OF BLISTER RUST CONTROL AS OF DECEMBER 31, 1945 BY LAND OWNERSHIP

LAND OWNERSHIP	WHITE PINE IN CONTROL AREA (Acres)	CONTROL AREA (White Pine & Protective Zone) (Acres)	INITIALLY WORKED (Acres)	PERCENT INITIALLY WORKED	INITIALLY UNWORKED (Acres)	MAINTEN- ANCE (Acres)	PERCENT ON MAIN- TENANCE	SECOND WORKING (Acres)	OTHER WORKING (Acres)
National Forest Lands	375,811	1,508,106	1,478,759	98	29,347	1,332,774	90	54,606	11,609
National Park Lands	61,616	122,974	120,149	98	2,825	106,410	86	5,964	2,841
Indian Lands	22	445	445	100		445	100		
TOTAL FEDERAL LANDS	937,449	1,631,525	1,599,353	98	32,172	1,469,629	86	60,570	14,510
State & Private Lands	2,015,627	4,675,050	4,613,639	99	61,411	4,301,824	92	133,914	25,027
TOTAL ALL LANDS	2,953,076	6,306,575	6,212,992	98	93,583	5,771,453	91	194,484	39,537

PART III

OMNIBUS TABLES



TABLE 1 - SHEET 1
SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES - 1945

STATE	OPERATING AGENCY	FIRST WORKING					SECOND WORKING				OTHER WORKINGS			
		Acres With- out Ribes	Acres With Ribes	Total Acres	Ribes Destroyed	Man- Days	Acres	Ribes Destroyed	Man- Days	Acres	Ribes Destroyed	Man- Days	Ribes Destroyed	Man Days
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)		
Virginia	Bureau For. Ser. Park Ser.	41,495 1,113	1,546 1,306	43,041 1,306 1,113	55,781 206,970	877 1,299 50	3,349 17,615	26,617 770,525	240 4,226	258 2,494	3,787 37,328	65 758		
North Carolina	Bureau Park Ser.	33,257	1,205	34,462	11,822 141	310 2	593	8,821	91	669	3,981	89		
ALABAMA I	Bureau For. Ser. Park Ser.	74,752 1,113	2,751 1,306	77,503 1,306 1,114	67,603 206,970 141	1,187 1,299 52	3,942 17,615	35,438 770,525	331 4,226	927 2,494	7,768 37,328	154 758		
West Virginia	Bureau For. Ser.	4,335	1,700	6,035	92,523	328	4,963 4,791	48,245 97,557	923 1,330					
Kentucky	Bureau For. Ser.				(R e s u r v e y		66 O n l y	749	10					
Tennessee	Bureau						839	11,833	326					
Georgia	Bureau For. Ser.	33,593 99,330		33,593 99,330		408 1,015				134	12,637	120		
ALABAMA II	Bureau For. Ser.	33,593 103,665	1,700	33,593 105,365	92,523	408 1,343	5,867 4,791	60,827 97,557	1,259 1,330	134	12,637	120		
ALL STATES	Bureau For. Ser. Park Ser.	108,345 103,665 1,113	2,751 3,006 1	111,096 106,671 1,114	67,603 299,493 141	1,595 2,642 52	9,809 22,406	96,265 868,082	1,590 5,556	1,061 2,494	20,406 37,328	274 758		
GRAND TOTAL		213,123	5,758	218,881	367,237	4,289	32,215	964,347	7,146	3,555	57,733	1,032		



TABLE 1 - SHEET 2

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES - 1945

STATE	OPERATING AGENCY	ALL WORKINGS							PER ACRE		Number of Camps	Total Seasonal Employees
		Acres With- out Ribes	Acres With Ribes	Total Acres	Ribes Destroyed	Man Days		Ribes	Man- Days			
						R.Free	R.Bear.					
(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)	(10)	(11)	
Virginia	Bureau Forest Service Park Service	41,495	5,153	46,648	86,185	191	991	16.7	0.19	1	43	
		1,113	21,415	21,415	1,014,823	50	6,283	47.4	0.29		88	
North Carolina	Bureau Park Service	33,257	2,467	35,724	24,624	199	291	9.9	0.12	1	15	
			1	1	141		2	141.0	2.00		2	
TOTAL AREA I	Bureau Forest Service Park Service	74,752	7,620	82,372	110,809	390	1,282	14.7	0.17	2	58	
		1,113	21,415	21,415	1,014,823	50	6,283	47.4	0.29		88	
			1	1,114	141		2	141.0	2.00		6	
West Virginia	Bureau Forest Service	4,335	4,963	4,963	48,245	41	923	9.7	0.19		35	
			6,491	10,826	190,080		1,617	29.3	0.25		33	
Kentucky	Bureau Forest Service		65	65	749		10	11.5	0.15		6	
											5	
Tennessee	Bureau		839	839	11,833		326	14.1	0.39		10	
Georgia	Bureau Forest Service	33,593	134	33,727	12,637	408	120	94.3	0.89	1	9	
		99,330		99,330		1,015					11	
TOTAL AREA II	Bureau Forest Service	33,593	6,001	39,594	73,464	408	1,379	12.2	0.23	1	60	
		103,665	6,491	110,156	190,080	1,056	1,617	29.3	0.25		49	
ALL STATES	Bureau Forest Service Park Service	108,345	13,621	121,966	184,273	798	2,661	13.5	0.19	1	118	
		103,665	27,906	131,571	1,204,903	1,056	7,900	43.2	0.28		137	
		1,113	1	1,114	141	50	2	141.0	2.00	2	6	
GRAND TOTAL		213,123	41,528	254,651	1,389,317	1,904	10,563	33.5	0.25	3	261	

^x Use Peak Season Employment^{xx} Per Acre figures based on Ribes-Bearing Acreage only and Man-Days expended only on Ribes Eradication.



TABLE A

STATUS OF RIBES ERADICATION BY STATES - ALL OWNERSHIPS, DECEMBER 31, 1945
(Net Figures)

STATE	TOTAL ACRES		FIRST WORKING		SECOND WORKING		OTHER WORKINGS		ON MAINTENANCE		REMAINING WORK	
	White Pine	Control Area (Wh.P.&Prot.Zone)	Acres	Per Cent	Acres	Per Cent	Acres	Per Cent	Acres	Per Cent	Unworked Acres	Requiring Rework Acres (Col.4-8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		
Delaware	214	4,682	4,682	100								
Maryland	72,973	175,156	172,867	98	17,705	19,852	4,682	100	2,289		18,461	
Virginia	447,138	1,157,740	1,096,897	95	58,464	16,469	915,496	88	60,843		181,401	
North Carolina	715,381	1,694,456	1,694,456	100	9,063	3,417	1,678,988	99			15,468	
West Virginia	1,235,706	3,032,034	2,968,902	98	85,232	39,738	2,753,572	91	63,132		215,330	
West Virginia	330,620	838,851	828,900	99	91,520		634,170	75	9,951		194,730	
Kentucky	62,417	80,565	80,565	100	65		80,565	100				
Tennessee	760,149	1,635,757	1,631,257	99	15,557		1,599,778	98	4,500		31,479	
South Carolina	15,137	29,635	29,635	100			29,635	100				
Georgia	549,047	689,733	673,733	98	2,110	399	673,733	98	16,000			
Alabama, Area II	1,717,370	3,274,541	3,244,090	99	109,252	399	3,017,881	92	30,451		226,209	
TOTAL	2,253,076	6,306,575	6,212,992	95	194,484	40,137	5,771,453	91	93,583		441,539	

SUMMARY OF STATUS OF RIBES ERADICATION BY LAND OWNERSHIP, DECEMBER 31, 1945
(Accumulative Net Figures)

28.



TABLE C - SHEET 1
SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES 1918 - 1945
(Accumulative Gross Figures)

STATE	OPERATING AGENCY	FIRST WORKING				SECOND WORKING			
		Acres With- out Ribes	Acres With Ribes	Total Acres	Ribes Destroyed	Man Days	Acres	Ribes Destroyed	Man Days
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Delaware	Bureau	4,682		4,682	4,113	268			
Maryland	Bureau	139,808	36,500	176,308	3,179,404	12,922	38,534	405,687	4,460
Virginia	Bureau	683,701	202,961	886,662	5,852,233	56,137	48,246	1,060,870	10,541
	Forest Service Park Service	163,567 9,786	39,409 10,875	202,976 20,661	357,611 1,264,566	1,360 12,286	9,646 10,101	566,327 356,344	4,055 4,418
North Carolina	Bureau	1,618,247	15,619	1,633,866	2,274,701	42,658	8,564	323,367	11,023
	Forest Service Park Service	48,512 16,072	1,285 527	49,797 16,599	52,087 24,418	1,014 456	419 326	7,086 2,362	156 78
TOTAL AREA I	Bureau	2,446,438	255,080	2,701,518	11,310,451	111,985	95,444	1,789,924	26,024
	Forest Service Park Service	212,079 25,858	40,694 11,402	252,773 37,260	409,698 1,288,984	2,374 12,742	10,065 10,427	573,413 358,706	4,211 4,496
West Virginia	Bureau	529,455	259,821	789,276	5,636,865	41,909	70,339	1,154,099	14,106
	Forest Service	26,683	12,941	39,624	351,132	4,275	21,181	248,834	5,416
Kentucky	Bureau	80,500	65	80,565 (Resurvey Only)	3,941	837	65	749	10
Tennessee	Bureau	1,117,428	29,257	1,146,685	3,935,067	30,574	56,891	397,503	4,779
	Forest Service	538,158	3,235	541,393	1,966,590	11,138	24,089	24,033	528
South Carolina	Bureau	29,635		29,635	7,487	1,427			
Georgia	Bureau	437,536	1,963	439,499	3,173,972	15,931	1,895	349,573	2,656
	Forest Service	233,714	520	234,234	7,286	2,911	215	7,090	181
TOTAL AREA II	Bureau	2,194,554	291,106	2,485,660	12,757,332	90,678	129,190	1,901,924	21,551
	Forest Service	798,555	16,696	815,251	2,325,008	18,324	45,485	279,957	6,125
ALL STATES	Bureau	4,640,992	546,186	5,187,178	24,067,783	202,663	224,634	3,691,848	47,575
	Forest Service Park Service	1,010,634 25,858	57,390 11,402	1,068,024 37,260	2,734,706 1,288,984	20,698 12,742	55,320 10,427	853,370 358,706	10,336 4,456
TOTAL STATES		5,677,434	614,978	6,292,462	28,091,473	236,103	290,611	4,903,924	62,407

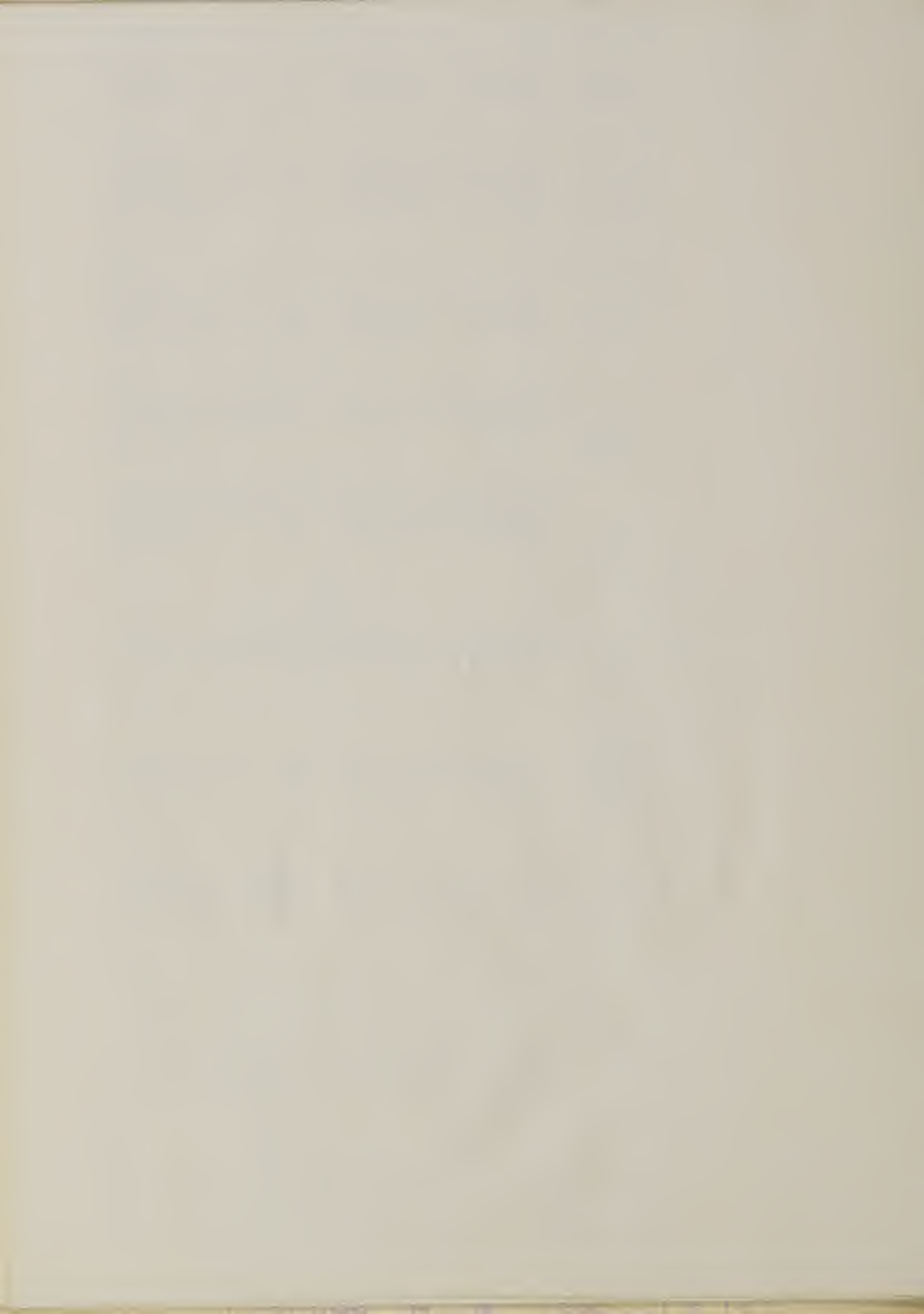


TABLE C - SHEET 2

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES 1918 - 1945
(Accumulative Gross Figures)

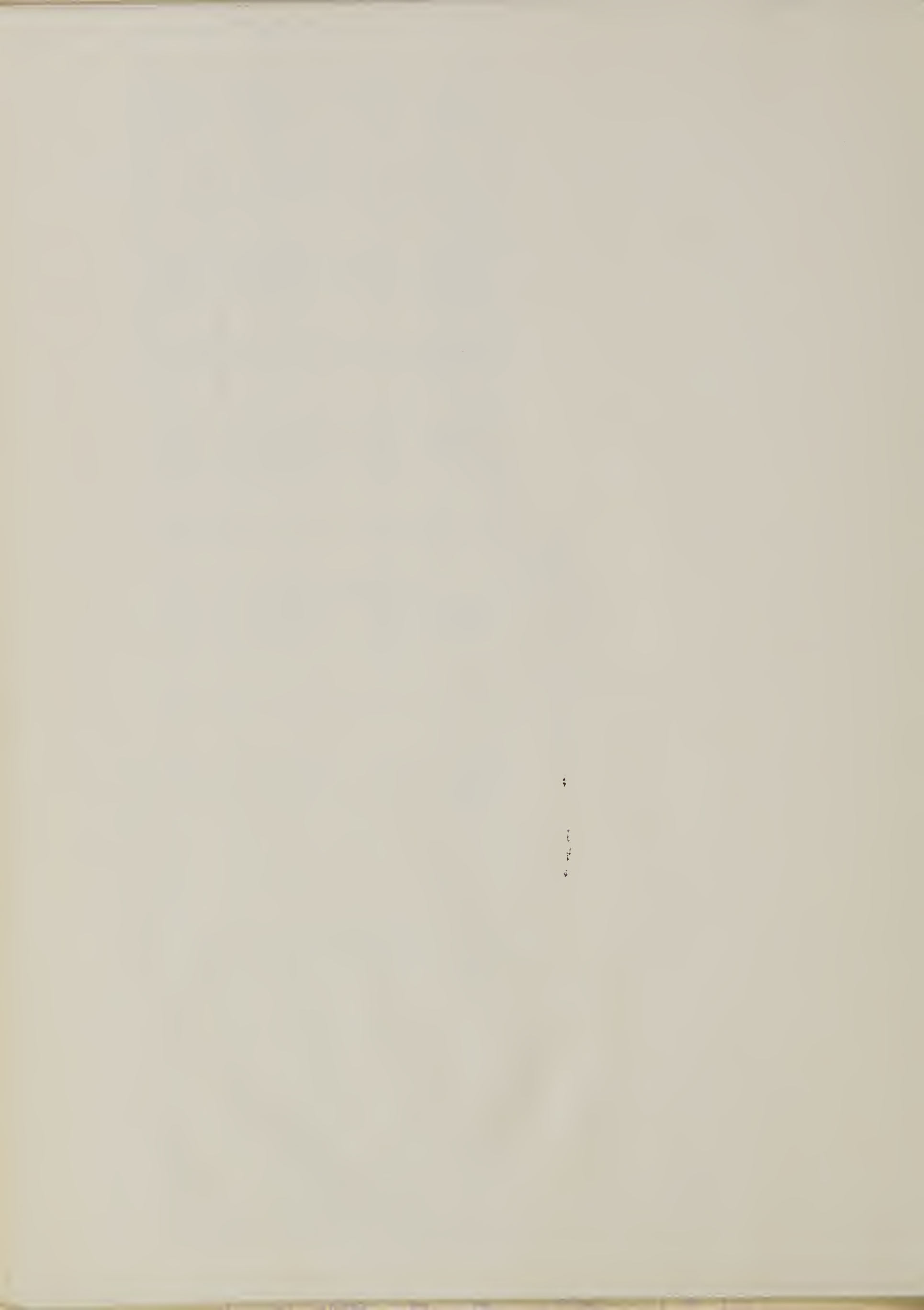
STATE (1)	OPERATING AGENCY (2)	OTHER WORKINGS				ALL WORKINGS						PER ACRE	
		Acres (3)	Ribes Destroyed (4)	Man Days (5)	Acres With- out Ribes (6)	Acres with Ribes (7)	Total Acres (8)	Ribes Destroyed (9)	Man Days (10)	Ribes (11)	Man Days (12)		
Delaware	Bureau				4,682		4,682	4,113	268	0.9	.06		
Maryland	Bureau	19,853	207,311	4,965	139,808	94,887	234,695	3,792,402	22,347	16.2	.09		
Virginia	Bureau	12,443	476,835	5,741	683,701	263,650	947,351	7,389,938	72,419	7.8	.08		
	Forest Service Park Service	2,488 2,328	79,707 208,224	766 3,615	163,567 9,786	51,543 23,304	215,110 33,090	1,003,645 1,829,134	6,181 20,319	4.7 55.3	.03 .61		
North Carolina	Bureau	1,970	29,002	924	1,618,247	26,253	1,644,500	2,627,070	54,605	1.5	.03		
	Forest Service Park Service	1,375 72	3,543 1,181	117 39	48,512 16,072	3,079 925	51,591 16,997	62,716 27,961	1,287 573	1.2 1.6	.02 .03		
TOTAL AREA I	Bureau	34,266	713,148	11,630	2,446,438	384,790	2,831,228	13,813,523	149,639	4.7	.05		
	Forest Service Park Service	3,863 2,400	83,250 209,405	883 3,654	212,079 25,858	54,622 24,229	226,701 50,087	1,066,361 1,857,096	7,468 20,892	3.9 37.1	.03 .41		
West Virginia	Bureau				529,455	330,160	859,615	6,790,964	56,015	7.9	.07		
	Forest Service				26,683	34,122	60,805	599,966	9,691	9.8	.16		
Kentucky	Bureau				80,500	130	80,630	4,690	847	0.06	.01		
Tennessee	Bureau				1,117,428	86,148	1,203,576	4,332,570	35,353	3.6	.03		
	Forest Service				538,158	27,324	565,482	1,990,623	11,666	3.5	.02		
South Carolina	Bureau				29,635		29,635	7,487	1,427	0.3	.05		
Georgia	Bureau	399	17,385	407	437,536	4,257	441,793	3,540,930	18,994	8.0	.04		
	Forest Service				233,714	735	234,449	14,376	3,092	0.06	.01		
TOTAL AREA II	Bureau	399	17,385	407	2,194,554	420,695	2,615,249	14,676,641	112,636	5.6	.04		
	Forest Service				798,555	62,181	860,736	2,604,965	24,449	3.0	.03		
ALL STATES	Bureau	34,665	730,533	12,037	4,640,992	805,485	5,446,477	28,490,164	262,275	5.2	.05		
	Forest Service Park Service	3,863 2,400	83,250 209,405	883 3,654	1,010,634 25,858	116,803 24,229	1,127,437 50,087	3,671,326 1,857,096	31,917 20,892	5.2 37.1	.03 .41		
GRAND TOTALS		40,928	1,023,188	16,574	5,677,484	946,517	6,624,001	34,018,585	315,084	5.1	.05		

* Per Acre figures based on total acres and total man-days.



TABLE D - SHEET 4
ACREAGE WORKED BY LAND OWNERSHIP
(Accumulative Gross Figures)

LAND OWNERSHIP	FIRST WORKING			SECOND WORKING	OTHER WORKINGS		ALL WORKINGS
	Acres Without Ribes (2)	Acres With Ribes (3)	Total Acres (4)		Acres (6)	Acres (7)	
National Forest	1,316,150	155,399	1,471,549	54,676	11,669	1,537,894	
National Park Indian	107,522 445	26,083	133,605 445	15,493	3,631	152,729 445	
Sub-total - INTERIOR	107,967	26,083	134,050	15,493	3,631	153,174	
TOTAL - SUBAL	1,424,117	181,482	1,605,599	70,169	15,300	1,691,068	
State and Private	4,253,367	433,496	4,686,863	220,442	25,628	4,932,933	
GRAND TOTAL	5,677,484	614,978	6,292,462	290,611	40,928	6,624,001	



PART IV

Work Project BL- 3-2

Detailed Reports on Blister Rust Control on
State and Private Land - 1945 *

By

Henry E. Yost, P-3, Area Leader, Area No. 1

H. B. Teague, P-2, Assistant Area Leader

Ralph W. Welch, P-3, Area Leader, Area No. 2

W. V. Zimmer, P-2, Assistant Area Leader

* These Reports include summaries of all
Control Work by States and are to be
Issued as Separate State Reports to
the Cooperators



WHITE PINE BLISTER RUST CONTROL

IN THE

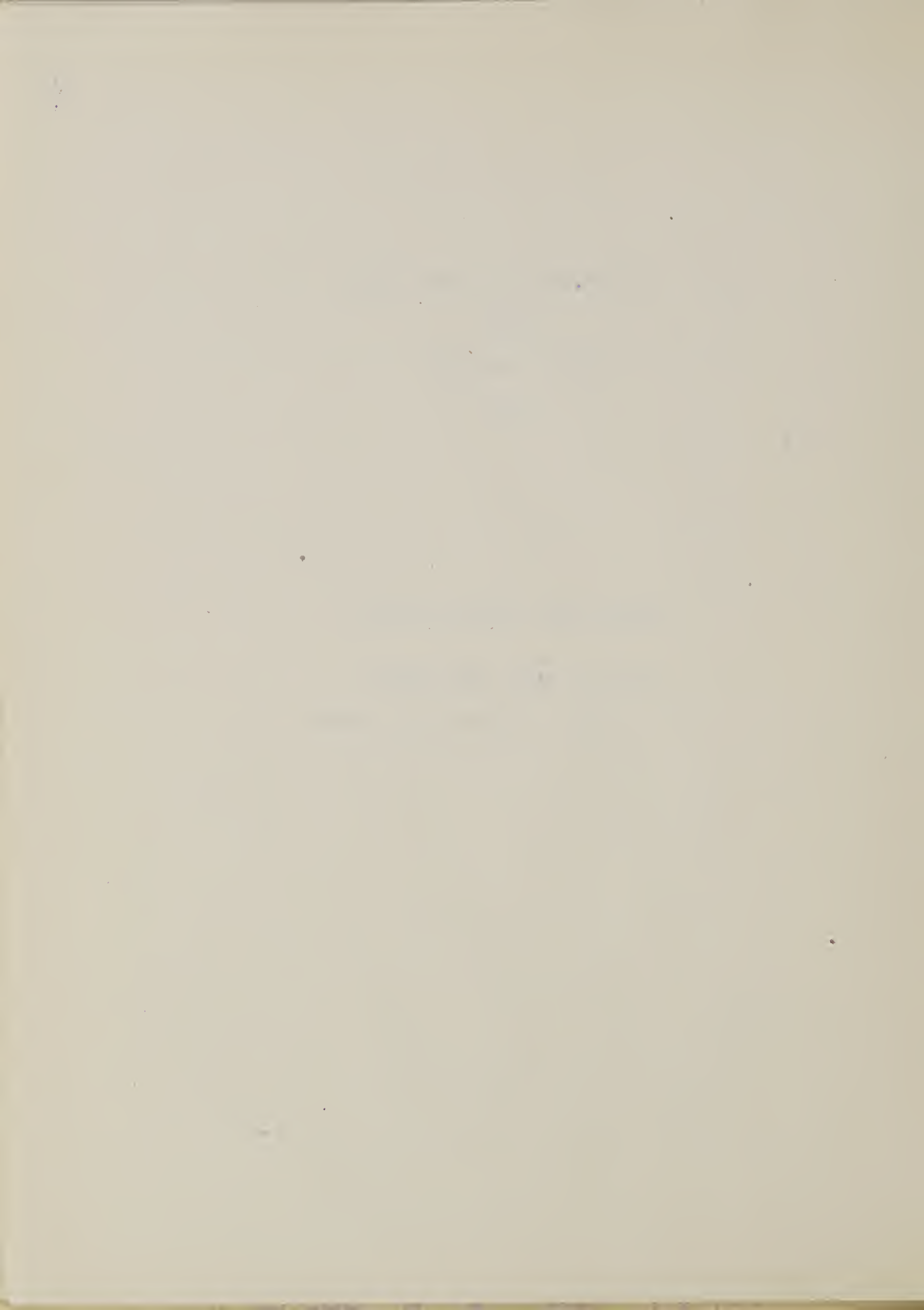
STATE OF DELAWARE

1945

BLISTER RUST CONTROL AREA NO. 1

Henry E. Yost - Area Leader

H. B. Tague - Assistant Area Leader



SUMMARY OF WORK IN 1945

Following a year without any blister rust control work in Delaware, a ten day inspection of white pine and ribes was made during July 1945 by Mr. Edward A. Andrews, Assistant Plant Pathologist, State Board of Agriculture, and Mr. H. B. Teague, Agent of the U. S. Department of Agriculture. Time did not permit thorough coverage of all of the white pine and ribes areas but a good cross-section of the State was inspected. Blister rust was found on ribes at three locations during August. These bushes were again inspected by Mr. Andrews during the late summer at which time the rust appeared to be about the same. No infected white pines were found.

During the year suggestions for a revision of the Federal Blister Rust Quarantine were requested by the Bureau of Entomology and Plant Quarantine. The State Quarantine prepared by Dr. Hopperstead, State Plant Pathologist, was believed satisfactory and therefore submitted without change. To date no further action has been taken by the Bureau. The State Plant Pathologist's office continues to be the cooperating State Agency, with Mr. Andrews directly responsible for the satisfactory execution of the work.

The following is a summary of control work performed in 1945:

Number of ribes sites inspected	33
Number of the above sites inspected which had no ribes.....	13
Number of new locations of ribes found (10 bushes).....	5
Number of places having blister rust on ribes	3
Number of places where owner had eradicated own bushes (704 ribes removed since initial working).....	7
Number of places where white pine was inspected.....	21
Number of white pine plantations examined.....	3

STATUS OF WHITE PINE

White pines in Delaware are mostly ornamental trees; but in recent years there has been a decided increase in reforestation of submarginal land with white pine. Most of the trees observed in 1945 were healthy and making good growth, with only an occasional tree showing any effects of insects or disease. The worst damage seen was from chlorotic dwarf in both ornamental and field plantings, but the number of trees affected was less than 5% of the total observed in any area. It is of particular interest that no weevil damage was seen in Delaware. This insect has caused a great deal of concern in many sections of the country due to its repeated killing of the main leader of the tree.

It is of interest to note that during the spring of the year, 17,275 white pine seedlings were shipped from the State Forest Nursery for reforestation purposes. They were shipped to 17 different individuals, some of which were in each county of the State

In two locations white pine was observed to be seeding in from old planted trees. One of these is at the Sunny Hills School, southeast of Hockessin, where the trees have taken over several acres of old fields and are making good growth in a pure stand. The other location is three miles west of Georgetown where white pine is doing well in a mixture with yellow pine.

From observations made in 1943 and again in 1945, white pine is well adapted to the soil and climate in Delaware and is definitely on the increase through planting as well as through natural reproduction.

TABLE I

STATUS OF CONTROL AS OF DECEMBER 31, 1945

White Pine:	Control:	Control:	Control:	Total :	Total :	Per cent:	Acres on :
:Acreage in:	:Acreage:	:Acreage:	:Acreage:	:Ribes :	:Man- :	:Initial:	:Mainten- :
: Control :	: in :	:Initially Reworked	: Des- :	: Days :	: Work :	: ance :	
: Area :	: State :	: Worked :	: troyed:	: Completed			
:	:	:	:	:	:	:	:
: 214 :	: 4,682 :	: 4,682 :	: — :	: 4,113:	: 268 :	: 100 :	: 4,682 :
:	:	:	:	:	:	:	:

* Does not include 704 ribes destroyed in 1945 by the owners.

STATUS OF RIBES

Initial eradication work has been performed in most of the white pine growing sections of Delaware and a large number of the Ribes found have been destroyed. In addition to the bushes eradicated by the Blister Rust Control workers, land owners have followed up by eradicating their own bushes in some sections. Of the total of 33 ribes sites examined in 1945, seven, or 21%, had been removed by the owners with 704 bushes being removed. In addition to those destroyed, many bushes have died through neglect and their lack of adaptability to the soil and climate. Although a few owners desire to retain their bushes, the majority expressed a desire to cooperate and protect the white pine by eradicating their ribes bushes. Mr. Andrews has formulated an excellent plan for presenting the need for removal of bushes by the owners and plans to contact many owners in his normal work.

RECOMMENDATIONS

Ollister rust has been found on ribes in Delaware for several years, but to date, none has yet been found on white pines. The control program in Delaware is not serious, but there is constant threat of damage to valuable ornamental plantings if ribes are present. There are no known wild ribes bushes growing in the state, but there are still a considerable number of cultivated ribes, some of which are located near white pines. The following recommendations for future work in Delaware are submitted to supplement those already made in previous reports.

1. That the cooperative white pine ollister rust control program be continued each year with one man working possibly 6 months each summer to 13. Whenever funds and labor permit, employ two men for two or three months to survey areas not covered by the individual fore, to map the white pine areas, and to urge the land owners to cooperate in removing their bushes. There remains about \$40,000 in Federal funds which are available for this purpose to June 30, 1946.
2. That white pine and ribes be inspected for ollister rust whenever it is practicable to do so.
3. That an annual observation be made in detail of a few known locations of ribes growing in close association with white pine; to determine the source of infection for the ribes infection and whether it later becomes established on white pine growing in close proximity to the ribes growing.
4. That ollister rust control information be included in all exhibits at the State Fair.
5. That other agencies continue to cooperate with the State Forester in his efforts to encourage removal of undesirable land to plant white pine in Delaware. The greatest danger of native ribes and the rapid growth and high quality of white pine timber of the state, makes the growing of white pine a good investment in the submarginal lands.



WHITE PINE BLISTER RUST CONTROL

IN THE

STATE OF MARYLAND

1945

BLISTER RUST CONTROL AREA NO. 1

Henry E. Vost - Area Leader

H. B. Teague - Assistant Area Leader

SUMMARY OF WORK IN 1945

During 1945 no ribes eradication or survey work was carried on in the State of Maryland. Plans were made with the State Forester to do a limited amount of work in Allegany County but due to the scarcity and high cost of labor no work was attempted. One day was spent in the early spring making a general examination of the wild ribes bearing areas on the Fifteen Mile Creek section of Allegany County. Several ribes bushes were observed, which were making fair growth. The observation indicated the need for reworking this area. Since the bushes are relatively few per acre, the eradication work should be done during that period in the spring of the year when only ribes are in leaf. In addition to the observations in Allegany County, two days were spent making a general examination of several control areas in Garrett County. The total amount of areas examined was too small to give any comprehensive figures on a per acre basis for the country, but several ribes bushes were found in many locations and indicate the need for rechecking the control areas in this county.

During the fall of the year, two days were spent scouting for the rust in the eastern counties. Infection was found, for the first time, in Cecil County. Several cultivated ribes bushes were examined in Kent and Queen Annes Counties, but no rust was found. Later in the fall, Dr. E. A. Walker, Assistant Plant Pathologist of the University, found blister rust, for the first time, in Anne Arundel County. The infection was on cultivated gooseberries in the vicinity of Annapolis. There were from fifty to sixty of these bushes and they were growing within 400 feet of a one-acre plantation of white pine, which was recently established. There were about five large ornamental white pines nearby.

Observations were made on a few study plots in the State. Since these studies are not complete no further report will be needed at this time, except to state that the rust is still continuing to spread and intensify.

During the year Dr. Walker also secured information for the Soil Conservation Service, regarding white pine plantings for the past several years. Information was secured from seven counties, which indicated that white pine has been planted on 72 farms and covered, in mixed plantings, 256 acres. No check has been made on very many, if any, of these plantings to determine the presence of any ribes bushes.

Federal Quarantine 63 is in the process of being revised. During the year a conference was held with Dr. Walker, at which time suggested changes were made. The principle change in the Quarantine will consist of designating control areas where practicable by post office, rather than by counties, election districts, or other descriptions. This will reduce, to a great extent, the amount of investigative work required before a shipping permit can be issued or refused.

STATUS OF CONTROL

The status of control work remains the same as indicated in last year's annual report, and is shown in the following table:

TABLE I

STATUS OF CONTROL WORK IN MARYLAND AS OF DECEMBER 31, 1945

White Pine	Control	Control	Control	Total	Total	Percent	Acres On
Acres	In	Acres	Acres	Ribes	Man-	Initial	Mainte-
Control	In The	Initially	Re-	Des-	Days	Work	nance
Area	State	Worked	worked	troyed		Completed	
72,973	175,156	172,867	37,557	3,792,402	22,347	93	154,406

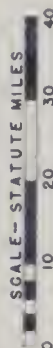
Since less than 1,000 acres, out of approximately 36,000 acres of ribes-bearing control areas in the State, have been worked since June 30, 1943, very little information is available regarding this situation. It can be safely presumed that ribes are coming back in many places and that the rust is spreading. During the war there was an abnormally large amount of timber cutting carried on, particularly in the mine prop and pulpwood operations. With such cuttings carried on in a control area we can expect a very heavy comeback of ribes, since they usually respond to the increased amount of light made available through the removal of the forest canopy. This timber cutting may, in many cases, likewise result in an increase in the amount of white pine where seed trees are present. The removal of the canopy and the disturbance of the soil brought about by cutting operations frequently create conditions favorable for the natural reproduction of the white pine.

WHITE PINE

Since very little field work was carried on during the last few years the description given in previous annual reports, particularly 1937, can still be accepted as the best available at this time. Statistics regarding

LEGEND

CONTROL AREA BOUNDARY	—	RIBES INFECTION ONLY	•
AREA INITIALLY WORKED	■	RIBES & WHITE PINE INFECTION	▲
AREA REWORKED	▨		

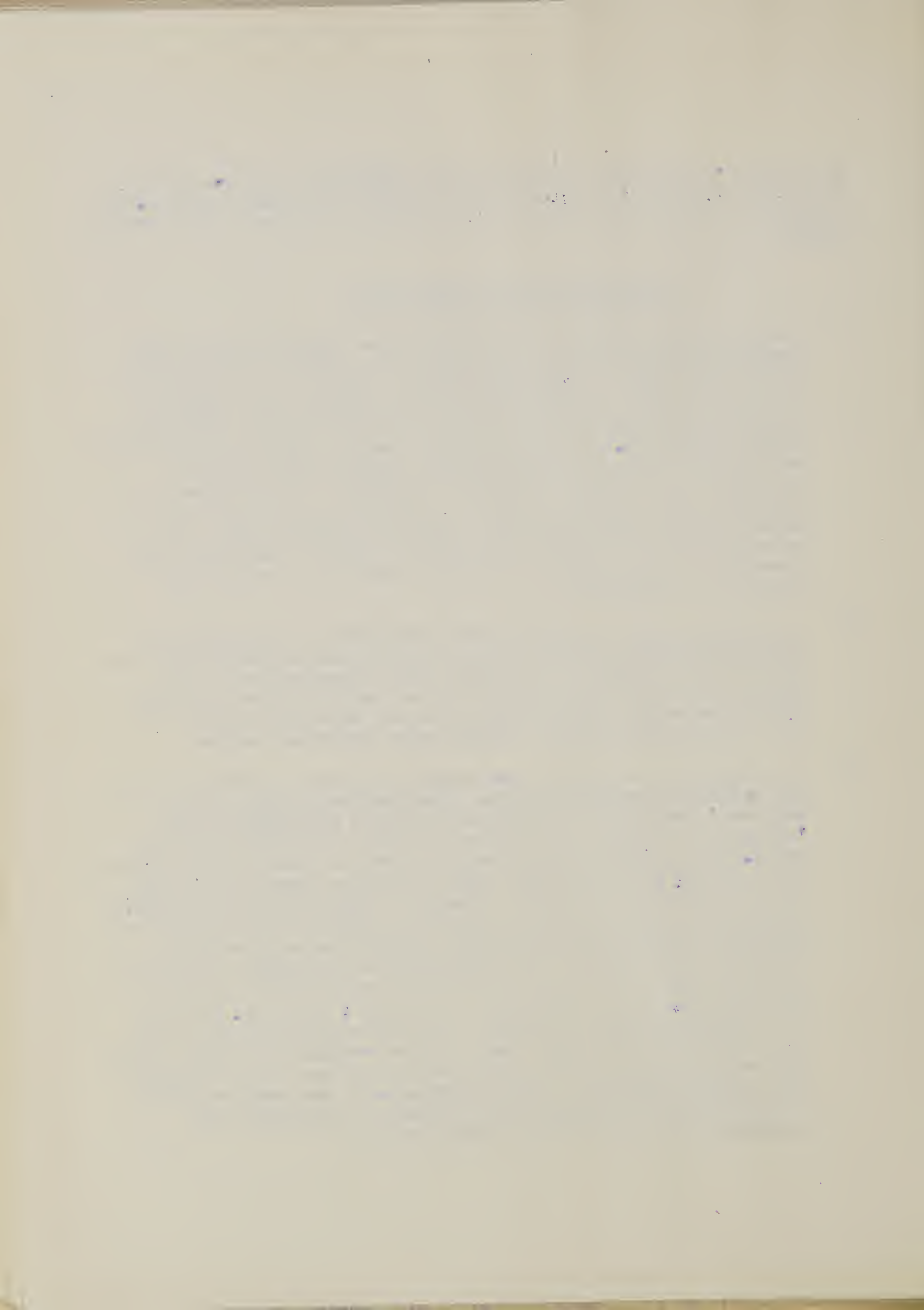




the cutting of white pine during 1945 and 1944 show a decrease of about 22 percent. It is believed that during the next five years we can expect a gradual decrease in the rate of cutting and an increase in the planting program.

RECOMMENDATIONS FOR FUTURE WORK

1. There has been allotted for the fiscal year ending June 30, 1946 \$2480.00 in Federal Funds and \$1000.00 from the State Department of Forests and Parks. This money should be used to do as much ribes eradication work as possible on the Fifteen Mile Creek section of the Greene Ridge State Forest during the early spring. This work should cover a period of two to three weeks or that time when leaves are present, only on the ribes bushes, which is usually from April 15 to May 15, depending upon the season. If this work is completed the remainder of the funds should be used in checking of higher priority, State owned pine areas in Garrett County. If a pressing need is found for eradication on some of the first areas examined it may be better to suspend checking and confine work entirely to eradication.
2. A definite policy and plan of operation should be formulated by interested persons early in 1946. It is suggested that a meeting be held for this purpose to be attended by representatives of the agencies most directly concerned. These should include the State Plant Pathologist, the State Forester, the Extension Forester, the Soil Conservation Service, and any other interested parties.
3. Since there are no Federal restrictions relative to blister rust on the interstate movement of white pines that would affect most Maryland Nursery men, the problem of nursery sanitation is left largely in the hands of the State officials. A policy should be established regarding this movement. Obviously some of the nurseries, and a control zone surrounding them, should be inspected and such ribes as are found destroyed. Examples of these would be the State Forest Nursery which grows thousands of seedlings for reforestation purposes, and those privately owned nurseries which grow large numbers of white pines to be transplanted as ornamental. The State obviously would not be justified in doing such work on a nursery which has only two or three white pine trees, therefore, the need for a definite policy is obvious. No nursery sanitation work has been carried on for several years. In the meantime it is very likely that many ribes bushes have been planted near some important white pine growing nurseries. This is particularly true when we consider a large amount of building in the vicinity of Baltimore and Washington, as well as the War Garden Drives.



WHITE PINE BLISTER RUST CONTROL WORK

IN THE

STATE OF VIRGINIA

1945

BLISTER RUST CONTROL AREA NO. 1

Henry E. Yost - Area Leader

H. B. Teague - Assistant Area Leader



SUMMARY OF 1945 WORK

During the year almost 250,000 acres were resurveyed, which is the most for any one year since the beginning of the program. Of the total acreage surveyed 101,664 acres were classed as ribes-free and 26,568 acres as ribes-bearing. On the latter acreage 1,101,008 wild ribes were eradicated. The remaining acreage surveyed and not reported as worked in 1945 will need additional post checks performed thereon in 1946 to determine the status of ribes eradication. Over \$74,000 was expended, which is the largest amount for any one year, 1940 being next with over \$71,000. Over 61 percent of the funds expended was for work on National Forest lands.

During the year the resurvey of white pine on all ownerships was completed in Washington, Smyth and Rockingham Counties. More than half of it is completed in Grayson, Wythe and Augusta Counties. Work is also under way in Shenandoah and Bath Counties.

Ribes eradication work was carried on in Augusta, Highland, Rockingham, Bath, Grayson, Smyth, Wythe and Washington Counties. Washington County was the only county in which the eradication work was completed on all ownerships.

The following is a resume' of the eradication work performed in the State in 1945:

TABLE I

SUMMARY OF RIBES ERADICATION IN 1945

Agency	First Working					Reworkings			
	Aores	Acres	Ribes	Des-	Man-	Acres	Des-	Man-	
	Free	Ribes	troyed	Days	Worked	troyed	Days		
State & Bureau	41,495	1,546	55,781	877	3,607	30,404	305		
Forest Service		1,306	206,970	1,299	20,109	807,853	4,984		
Park Service	1,113			50					
Total	42,608	2,852	262,751	2,226	23,716	838,257	5,289		

The above work by the Park Service represents survey work only on ribes free land, of which 1.113 acres were covered.

In addition to the above work, a considerable amount of time was spent in checking. This is divided into three classes, i.e. regular, advance and post, which are defined as follows:

Regular Check - An examination of an area immediately following an eradication job to determine the thoroughness of the crews work.

Advance Check - An examination of an area, which has never been worked, to determine the need for eradication. This is usually a part of the survey job.

Post Check - An examination of a worked area two or more years after working, to determine the ribes come-back and the need for reworking it.

TABLE II

SUMMARY OF THE CHECKING WORK DURING 1945

Type of Check	Acres Covered	Approximate Percent Coverage	Man Days
Regular	24,049	4.5	271
Advance	5,605	4.9	131
Post	13,793	1.4	196
Total	43,447	4.5	598

* Percent coverage is based on the number of strip acres examined, i.e. on 24,049 acres covered 1,082 acres were actually examined.

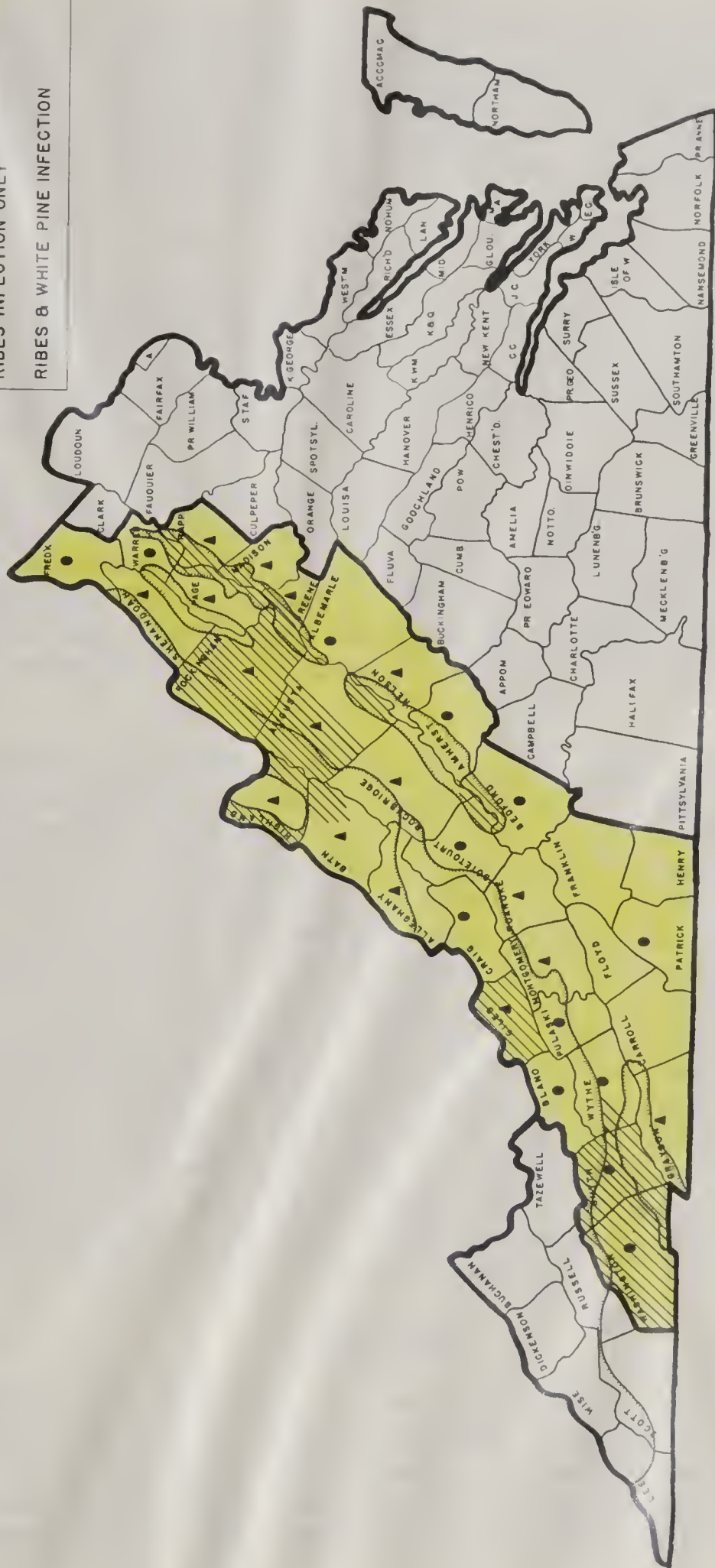
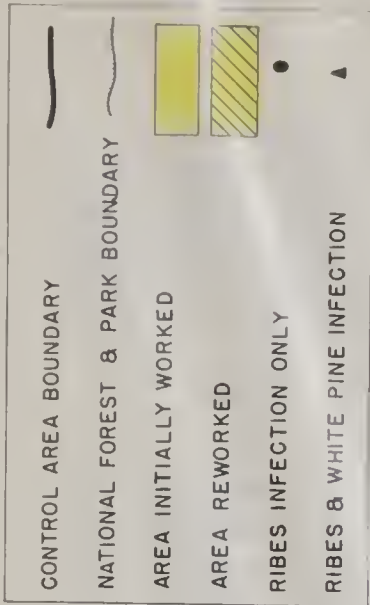
STATUS OF CONTROL

The status of the control as of December 31, 1945 is shown in the following table:

TABLE III

White Pine: Control Area	Control : In The State	Control : Initially Worked	Control : Reworked	Total : Destroyed	Total : Ribes	Per Cent : of Initial Work	Acres : On Main-tenance
447,138	1,157,740	1,096,897	74,933	10,222,717	98,919	95	915,496

LEGEND





Because of discrepancies in some of the early records the true status of blister rust control cannot be accurately determined until all resurveys are completed. As the survey progresses old estimated white pine and control acreage figures will be eliminated. The status as shown in Table III is adjusted with respect to the resurvey as completed to date.

The status of the resurvey may be summarized as follows:

1. Number of counties in the control area..... 33
2. Number of counties in which resurvey is completed..... 3
3. Number of counties in which resurvey is over half completed..... 5
4. Number of counties that will probably be completed in 1946,
including Items 2 and 3 above..... 16

If the rate of progress in 1945 can be maintained throughout 1946 and 1947, most of the resurvey should be completed. Considering only the number of counties, the progress during the last two years seems low but the work was begun in most of the largest white pine counties first. Also, many of the 33 counties included in the control area have only scattered areas of white pine which can be rapidly covered on the resurveys.

The status of the blister rust appears to be much the same as last year except for Grayson County. As of December 1944, no infection was known on white pine any farther south than in the north end of Montgomery County. During the spring of 1945 the rust was found on one white pine tree near White Top Post Office in Grayson County. During the summer it was found on several trees in the vicinity of Comers Rock, also in Grayson County. The first infection appeared to have originated about 1942 and the second about 1943. In the fall an infection covering about three acres was found in Ashe County, North Carolina and appears to have originated about 1936. This infection is about 10 miles south of the junction of Virginia, Tennessee and North Carolina State lines. It, therefore, seems reasonable to assume that there are several centers of infection in the southwest counties of the State. Of the three infections mentioned above, only the one at Comers Rock was in a control area. The extent of the damage is slight but the presence of the disease makes continued and careful control work necessary.

WHITE PINE

The white pine situation is much the same as described in last year's annual report. No data was obtained regarding the planting program but it is probably about the same. Reports indicate that this will probably increase in 1946. The rate of cutting white pine in 1945 was about 16% less than in 1944, with a cut of about 38,250,000 board feet.

Most of this reduction followed the end of the war. A slight reduction can be expected hereafter. However, it is probable that the present demand for white pine lumber for construction and industrial uses will continue for several years.

PERSONNEL

At the beginning of the year one of the most difficult problems was securing sufficient personnel. A marked improvement was noted immediately after the defeat of the so-called "Work-or-Else" legislation in Congress. Further improvement was noted after the close of the war. As of the end of the year, there was adequate labor available in most of the communities where work was being carried on. During the year three additional supervisors were employed. Mr. C. A. Rodamer, of Grantsville, Maryland, was stationed at Hot Springs working under the direction of Mr. Cramer. Rodamer has worked on blister rust control in Maryland prior to his entry into the army. Mr. Martin Q. Miller, a former agent in Virginia, returned to work in December. He was stationed at Staunton and is working under Mr. Cramer. Mr. Irvin L. Stringer of Kennarock, was promoted from foreman to supervisor. He is in charge of the work in Grayson County under the direction of Mr. Teague.

In the aggregate there were about 200 different individuals employed on all programs.

TABLE IV

PERSONS EMPLOYED BY OPERATING AGENCIES AT PEAK OF SEASON

:	:	:
:	Operating Agency	Number of Persons
:	:	:
:	Bureau and State	:
:	Funds	43
:	:	:
:	Forest Service	88
:	:	:
:	Park Service	4
:	:	:
:	Total	135

Mr. H. B. Teague, who is Assistant Area Leader stationed at Wytheville, Virginia, advised us of his intentions to resign about February 28, 1946. In all probability the vacancy will be filled by Mr. William V. Zimmer, who is now stationed in Dahlonega, Georgia.

FIELD STUDIES

No field studies, as such, were completed during the year. Several pine infections and ribes regeneration study plots are being maintained. A preliminary study was made of the white pine infection at Comers Rock. The study is believed to include all the infected trees in that immediate vicinity. It covered approximately one acre and included 56 trees, of which 21 were infected. Four rather widely scattered wild ribes bushes were observed. The location of the trees and ribes were plotted on a large scale map. The infection seemed to have originated mostly from one bush. The following shows the infection by concentric zones one-half chain in width, centering on the bush:

TABLE V

DATA FROM COMERS ROCK WHITE PINE INFECTION AREA

: Zone Number	: Total Number	: Number	: Per Cent	: Total	: Average No.
: Trees	: Infected	: Infected	: Number	: Cankers	: Infected Tree
: 1	: 7	: 5	: 71	: 530	: 106
: 2	: 18	: 12	: 67	: 124	: 10
: 3	: 13	: 3	: 45	: 6	: 2
: 4	: 9	:	:	:	:
: 5	: 4	:	:	:	:
: 6	: 4	:	:	:	:
: 7	: 1	: 1	: 100	: 1	: 1
: Total	: 56	: 21	: 36	: 661	:

The infection evidently occurred in 1943 and the ribes were destroyed in August 1945. Some additional infection could have occurred in 1944 and possibly in 1945. It is also probable that not all of the 1943 cankers were observed. Another inspection is planned for the spring of 1946.

In summarizing the above and considering only the first three zones we have 38 white pine trees on about 1/14 acre or about 532 trees per acre. One wild gooseberry, with about 350 feet of live stem, was found.

This bush in one year infected 20 trees, or 56% of the trees, with an average of 33 cankers per tree. This is an unusually heavy infection but illustrates what can happen under favorable circumstances.

OTHER ACTIVITIES

The only nursery sanitation performed was that which was carried on by the State Inspectors and consisted of looking for ribes bushes within the nursery and blister rust on the pine.

No canker elimination, as such, was carried on. The infections found at White Top Post Office and Comers Rock were cut out but this was regarded as a part of the observations.

During the year a resume of the blister rust control requirements by counties for the next five to eight years was prepared and submitted to the State Entomologist. This was for his use primarily and also for transmittal to the State Planning Board.

C O S T S

TABLE VI

SUMMARY OF EXPENDITURES IN 1945

Agency	Amount Expended Jan. 1 - Dec. 31 1945	Balance Available to June 30, 1946
Bureau		
Cooperative Funds	\$11,604.93	\$ 2,364.17
State Department of Agriculture	5,668.52	2,333.52
Subtotal - Cooperative	\$17,273.45	\$ 4,697.69
George Washington National Forest	32,080.20	8,174.38
Jefferson National Forest	13,587.36	4,856.28
Subtotal - Forest Service	\$45,667.56	\$13,030.66
Shenandoah National Park	1,385.19	734.11
Blue Ridge Parkway	117.16	717.84
Subtotal - Park Service	\$ 1,502.35	\$ 1,451.95
GRAND TOTAL - VIRGINIA	\$64,443.36	\$19,180.30

Table VI does not include Federal Administrative Costs. The costs per man-day for labor, as well as the overall costs, were higher than any previous year since the beginning of the program. Probably the lowest labor wage rate ever paid on blister rust control in the State was 19¢ per hour. This was on the W.P.A. program. The lowest rate this year was 50¢ per hour. The cost of operating trucks, particularly tires, have materially increased. Due to the influence of several factors the cost per acre in terms of man days was reduced on both eradication and survey.

RECOMMENDATIONS

1. Probably the most pressing need at present is trucks and automobiles. It appears that only army surplus may be available. We have been unable to secure any of these to date. If these are not available or prove to be unsatisfactory we should consider the possibility of purchasing some on State funds.
2. Since the close of the war we can expect increased activities in the field of conservation, particularly in reforestation and education. Our efforts should be directed toward encouraging the planting of white pine in the ribes free sections of the State, which are suitable for this species. This can probably be best accomplished by close cooperation with the State Forester, Extension Service, Soil Conservation Service, Vocational Agricultural Teachers and others.
3. The State should continue its participation in the program at about the present extent and the same fine cooperation that was given during 1945. We appreciate very much the close contact we have maintained with Mr. French's office and the interest shown by Mr. C. R. Willy in our field operations and progress of the work.



WHITE PINE BLISTER RUST CONTROL WORK
IN THE
STATE OF NORTH CAROLINA
1945

BLISTER RUST CONTROL AREA NO. 1

Henry E. Yost - Area Leader

H. B. Teague - Assistant Area Leader



SUMMARY OF 1945 WORK

A survey of white pine in the northern part of Ashe County was completed in the summer of 1945. This section had not been mapped before, due to the scattered locations of the white pine. This added 5,951 acres of white pine and 34,462 acres of control area to that already worked prior to 1945.

Resurvey work was started in Avery, Macon and Watauga Counties, using the grid system in areas previously covered by the "spot-mapping" system. That part, being worked in Watauga County, is all privately owned; in Avery it included intermingled lands of the Pisgah National Forest and in Macon County, it is composed of lands owned by private individuals intermingled with holdings of the Nantahala National Forest. No work was carried on by the National Forests.

Aerial photographs were used for the first time in North Carolina during 1945 in Ashe and Watauga Counties. The Ashe County work was experimental, and 8" to the mile grid maps showing roads and timberland areas were made from the photographs. We had access to photos of the Soil Conservation Service and used them for preparing the grid map.

In Watauga County, photographs with a scale of 4" to the mile were purchased, matched, and issued to the Field Supervisor with an index of the section to be surveyed. This index ties in with previous grid survey posts. From the photographs, field maps are stepped up to 8" to the mile and timber areas, roads and main streams outlined. Mappers use these maps and tie in with road intersections, streams, road crossings or other outstanding landmarks instead of using base lines. This saves over 30% of the cost of survey, speeds up the work and gives just as accurate maps as running base lines. No wild ribes have been found in the area and the future cost of maintenance will involve only locating and eradicating cultivated ribes.

Ribes eradication work was confined to Ashe, Avery and Watauga Counties on privately owned lands. The only initial work was in Ashe County. In this county ribes were found at the rate of slightly less than 10 per acre on initial work and about 1.5 per acre on a second working. The number of ribes per acre were about the same in Avery County. In Watauga County, which was also a second working, they were found at the rate of about 25 per acre. The area covered in this county was a more favorable ribes site and most of the bushes were small.

The eradication work on the Great Smokys National Park represented one small isolated pocket of wild bushes near Bryson City.

TABLE I

SUMMARY OF RIBES ERADICATION - 1945

Agency	First Working					Other Workings			
	Acres		Total		Ribes	Ribes			
	Acres	Ribes	Acres	Des-	Man-	Acres	Des-	Man-	
	Worked	Free	Worked	troyed	Days	Worked	troyed	Days	
Bureau									
Cooperation	1,205	33,257	34,462	11,822	310	1,262	12,802	180	
Great Smokeys									
National Park	1		1	141	2				
TOTAL	1,206	33,257	34,463	11,961	312	1,262	12,802	180	

STATUS OF CONTROL WORK AS OF DECEMBER 31, 1945

The resurvey is now completed in Ashe County. It is approaching completion in Watauga, Avery and Mitchell Counties. It was begun in Macon, Haywood, Madison and Mitchell Counties. Plans are under way to complete the resurvey as rapidly as possible. The status of eradication may be described as initially complete for practical purposes. So far the resurvey has indicated that white pine is spreading, which will necessitate some additional land being taken into the control area. There remains some reworking of wild ribes bearing areas as well as additional work on cultivated bushes.

The following table shows the status for all ownerships as based on the present survey data:

TABLE II

STATUS OF RIBES ERADICATION AS OF DECEMBER 31, 1945

White	Control	Control	Control	Total	Total	Per	Cent	Acres
Acreage	Acreage	Acreage	Acreage	Total	Total	Initial	Work	of
in Con-	in	Initially	Re-	Ribes	Man-	Work	main-	
trol Area	State	Worked	worked	Destroyed	Days	Completed	tenance	
715,381	1,694,456	1,694,456	12,480	2,717,747	56,465	100	1,678,928	

COOPERATION

The North Carolina Department of Agriculture continued its allotment of \$5,000 for the fiscal year ending June 30, 1946 for blister rust control work on private lands. Now that the rust has been found on white pine in the State, the work of preventing its spread into commercially important stands will be concentrated on those areas considered to be most favorable for the spread of the rust. A renewal of cultivated ribes elimination will be made in 1946.

There was no Forest Service work done in North Carolina during 1945, except on intermingled lands surveyed in Macon County late in the year. However, plans for resuming work on Forest Service lands were discussed with the Supervisors of the Nantahala and Pisgah National Forests.

The Pisgah Forest notified us that they are building a road into the western part of Mitchell County, previously inaccessible by truck; and that protection of several hundred acres of excellent young white pine is desirable. The Forest Service has given excellent cooperation to blister rust control work for many years.

Among the many other agencies which have cooperated with blister rust work are A.A.A., S.C.S., and the State Extension Service through County Farm Agents. In 1945 County Agents Baird in Avery County; Hamilton in Watauga County, Tuckwiller in Ashe County; and Palmer in Buncombe County were active in their assistance to work done in those counties. No work was done in other North Carolina counties in 1945.

Forester Savage of the National Park Service had several additional grids containing white pine surveyed in Haywood and Swain Counties during 1945. He also did scouting for ribes and rust on ribes in several sections of the Park. No rust was found. Work plans were set up for eradicating ribes on Mount Sterling in 1946, and a program was also set up for mapping additional areas on the Blue Ridge Parkway in 1946.

WHITE PINE

There is but little change in the white pine situation since the 1944 report. There was a reduction in the rate of cutting following the end of the war. The cut for 1945 was about 62,667,000 board feet as compared to 74,886,000 board feet for 1944; or a reduction of about 16 per cent. The planting of white pine was heavily reduced during the war but is now increasing. Discussions with Extension Service men and others indicate that the rate of planting in 1946 will be about the same as the pre-war level. During 1945 North Carolina cut about 45 per cent of all the white pine produced in the Southern Appalachian Region. The next State in line in the region was Virginia which produced approximately 50,000,000 board feet.

PERSONNEL

During the year the work was under the supervision of H. B. Teague. Mr. J. R. Tomlinson was in charge of the work in Ashe, Watauga, and Avery Counties. He used up to 15 men. Late in the year an eight man crew was employed in Macon County and was supervised by Mr. Fred Hall of Georgia. Mr. W. A. Stegall, Jr., was employed to head up the work in the State, under Mr. Teague's direction, late in the year. Mr. Stegall was employed as a supervisor for several years in Tennessee before entering the Army early in the war.

At the beginning of the year the quantity and quality of labor left much to be desired. Some improvement was noted when the so-called "Work-or-Else" bill was defeated in Congress. The situation gradually improved during the remainder of the year, particularly after V-J Day. Our policy continues to be first, preference to war veterans and next, to displaced war workers. We continue to cooperate in every way possible with farmers on all labor matters.

During the year there were two accidents involving compensation. One involved only a severe case of poison ivy and was cared for by the State. The other was on Federal Funds. In this case the man fell, injuring a nerve in his hip. He is now in the Marine Hospital at Louisville, Kentucky and is being cared for by the U. S. Employee's Compensation Commission.

BLISTER RUST

Blister rust was found on white pine for the first time in North Carolina in the fall of 1945. It was found on ribes along Highway No. 88 in the northwestern part of Ashe County. The extensive amount of rust on ribes indicated infection from a nearby source and the following week Mr. Teague found the rust on an isolated stand of white pine on the property of Mr. R. L. Ballou. This area had not been worked previously.

Blister rust was first found in North Carolina in 1941 on ribes in four counties, namely; Ashe, Avery, McDowell and Watauga. It was also found on ribes again in 1943 on Grandfather Mountain in Avery County; then on ribes and white pine in Ashe County in 1945.

The infected white pine area includes a stand of some three acres with at least half the trees infected, some having trunk cankers, and one tree was found that had died from the rust. The oldest canker found was on 1936 wood, indicating that the original infection occurred in 1936 or 1937. Three cankers were seen on 1936 wood. One large Ribes rotundifolium bush is in the heart of the infected area, and the other smaller bushes were seen nearby.

It is probable that there are other centers of infection in the northwestern counties of the State. There are numerous high ridges and mountains in the western end of the State where ribes bushes are abundant and small

stands or individual white pine trees are present. There is no practical way to prevent the rust from becoming established in such situations. The disease can, therefore, be expected to become established in many places throughout the western counties of the State. The loss of relatively few white pines so located will be of little importance on a State-wide basis but it will require continued and careful checking and eradication of the relatively few wild and cultivated ribes bushes growing in the better white pine stands.

COSTS

The amount of money expended during 1945 was slightly less than in 1944, however, the unexpended balance available to June 30, 1945 is over three times as great as it was last year. This is largely the result of increased work on the Great Smokys National Park and the transfer of \$5,000 Forest Service Funds from Georgia. The average per acre cost for ribes eradication was 95¢. The average cost per man-day was \$8.07. This cost includes supervision, materials, supplies and travel. Labor, wages and salary rates have increased; also truck operating costs have greatly increased. The following table gives a resume of the status of funds:

TABLE III

SUMMARY OF EXPENDITURES IN 1945

Operating Agency	Amount Expended	Balance of Funds Available January 1 thru June 30, 1945
Bur. Ent. & Pl. Quar.		
:(3103.14) (State & Private Lands)	\$6,281.04	\$ 4,623.96
State	2,227.21	2,772.79
Total - Cooperative	8,508.25	7,396.75
Nantahala National Forest		5,000.00 *
Park Service	1,333.62	3,427.70
Total All Funds	9,841.87	15,824.45

* Transferred from Chattahoochee National Forest in Georgia.

RECOMMENDATIONS

1. With blister rust established on white pine in Ashe County, apparently of 1936 or 1937 origin, it is recommended that scouting for rust be intensified during future years. Rust on ribes in the same area in Avery County in 1941 and 1943 indicate that diseased white pines are probably closer than Ashe County.
2. Many trucks which are now being used to haul labor over rough mountain roads are in poor condition. Many of these trucks are approaching the unsafe operating stage. It is recommended that efforts be increased to replace the old equipment.
3. For several years during the war program we ceased giving information on white pine seed conditions in accordance to the State Forests and to T.V.A. It is recommended that this practice be resumed in 1946.
4. No cultivated ribes eradication was conducted during the war years. It is recommended that special crews be detailed to remove cultivated ribes from the white pine growing sections, concentrating first on the areas nearest the known white pine infection center in North Carolina.
5. The resurvey of all white pine stands in the State should be carried to completion within the next two years. It will only be then that we will know the present status of white pine conditions in the State.
6. All ribes-bearing areas which have not been worked for three or more years should be post checked in 1946.

WHITE PINE BLISTER RUST CONTROL

IN THE

STATE OF WEST VIRGINIA

1945

BLISTER RUST CONTROL AREA NO. 2

Ralph W. Welch - Area Leader

W. V. Zimmer - Assistant Area Leader

SUMMARY OF CURRENT YEAR'S WORK

During 1945 white pine blister rust control operations were conducted in seven counties within West Virginia, including Greenbrier, Hampshire, Hardy, Pendleton, Pocahontas, Raleigh and Tucker Counties. Within this area, work was performed on the Monongahela and George Washington National Forests, through funds provided by the United States Forest Service, and on State and privately owned lands, through funds provided by the Bureau of Entomology and Plant Quarantine and the West Virginia Conservation Commission. The majority of the current year's work in the State was within areas which had received initial protection from blister rust through ribes eradication programs conducted six to nine years ago. In the years intervening between the first working and the second examination, ribes regeneration in many instances had occurred to the extent that the white pine was again endangered, therefore necessitating rework of many areas within the control area. In addition to the second workings performed in many of the counties, a considerable amount of initial work was done in Tucker County. Accomplishments within the State during the year are listed below:

- 1: Surveys were conducted over 128,100 acres of control area, within which 43,506 acres of white pine were located, mapped and classified as to size and density. This phase of the program is conducted preliminary to actual ribes eradication, so that areas supporting sufficient growth of white pine to merit ribes eradication measures can be delimited from areas where eradication is not necessary, due to absence of pine in sufficient quantities to justify cost of protection. In the current year, the survey phase of the program was accomplished at a labor cost of approximately four cents per acre of control area.
- 2: Checks were performed over 75,103 acres of control area to determine the need of ribes eradication within specific areas where ribes growth was suspected. As a result of these checks, 40,988 acres were found to be either free of ribes growth or supporting such a small amount of ribes growth as to cause little danger from the standpoint of the spread of blister rust. The checking phase of the program was accomplished at a labor cost of approximately four cents per acre, almost the same acreage cost as for survey work.
- 3: Eradication crews destroyed a total of 238,325 bushes over an area of 11,454 acres of ribes-bearing land. About eighty five per cent of this acreage represented second working, and with the completion of the reeradication program the majority of the acreage will not need an additional coverage within the next decade. The crews accomplished the eradication job with a total expenditure of 2,540 man-days labor. Thus, an average of 4.5 acres were covered per man-day, with an average of 20.8 bushes per acre. The labor cost of the eradication work

averaged slightly less than \$1.50 per acre. This cost includes both labor and operating expenditures.

TABLE I

STATUS AND SUMMARY OF CONTROL WORK IN WEST VIRGINIA AS OF DECEMBER 31, 1945

: White Pine : Control : Control :	: Total :		: Per Cent :	: Acres :
: Acreage : Acreage:Initially: Re- : Ribes : Man : Initial :	: Total :		: Initial :	: on :
: In Control: In : Worked : worked :Destroyed: Days : Work : Maintenance:	: Days :		: Work :	: Maintenance:
: Area : State : (1) : (2) :	: Completed:		: (3) :	:
: 330,620 : 838,851 : 828,900 : 91,520 :	: 7,390,930 :	: 65,706 :	: 99 :	: 634,170 :

(1) 272,762 acres ribes-bearing, 556,138 acres free of ribes

(2) Ribes-bearing acreage only

(3) Acreage needing a minimum of attention within the next ten years

COOPERATION

Work within the George Washington National Forest in Pendleton, Hardy and Hampshire Counties, and within the Monongahela National Forest in Pocahontas, Greenbrier and Tucker Counties was made possible through the appropriation of funds to the United States Forest Service. Technical supervision and general administration of the control work was afforded by the Bureau of Entomology and Plant Quarantine. Forest Service funds were used principally to protect white pine located on federal lands, although some amount of closely intermingled private tracts received the benefit of protection due to the proximity of such lands to the federally owned tracts.

By a cooperative agreement, the West Virginia Conservation Commission participated in the program by appropriating funds which were used in the protection of State and privately owned white pine. The Commission's appropriation of \$5,000 annually was used to supplement a somewhat larger allotment of federal funds provided by the Bureau of Entomology and Plant Quarantine by authority granted within the provisions of the "Lea Act," a legislative measure passed by Congress in 1940. Such a program of cooperation between the State and federal program is particularly desirable, since 79% of the 330,620 acres of white pine acreage within the boundaries of West Virginia is located on State and privately owned land. Forest Service funds are used in effecting a control program on the remaining 21% of the acreage, but State and federal "matching" funds must be depended upon for the bulk of the work on State Forests and Parks and privately owned tracts. The West Virginia Conservation Commission increased the

amount of available cooperative funds from \$5,000 annually in the 1944 and 1945 fiscal years to \$5,500 annually in the 1946 and 1947 fiscal years. Likewise, Federal matching funds were increased.

The West Virginia Department of Agriculture cooperated through the activities of the State Entomologist in conducting inspection work within the environs of various nurseries throughout the State, and through control of shipments of cultivated ribes, restricting such shipments to areas falling outside of the various control areas.

TABLE II

SUMMARY OF RIBES ERADICATION IN WEST VIRGINIA 1945

Agency	Acres							
	Worked:				First Working			
	Ribes				Ribes			
	Free				Acres			
					Destroyed	Days	Acres	Destroyed
Bureau & State							(1)	
(Private Lands)							4,963	48,245
Forest Service							(2)	
Monongahela	4,015	1,500	87,610	298	1,229	12,765	198	
Forest Service							(3)	
Geo. Washington	320	200	4,913	30	3,562	84,792	1,132	
Forest Service								
Sub-totals	4,335	1,700	92,523	328	4,791	97,557	1,330	
							(4)	
TOTALS	4,335	1,700	92,523	328	9,754	145,802	2,253	

- (1) An additional 7,283 acres examined was free of ribes
- (2) An additional 8,880 acres examined was free of ribes
- (3) An additional 20,490 acres examined was free of ribes
- (4) An additional 36,653 acres examined was free of ribes

WHITE PINE PRODUCTION

The stumpage volume of white pine cut and manufactured into lumber in West Virginia during 1945 exceeded the 1944 volume by twenty nine percent. West Virginia was the only State within a group of six states in the Southern Appalachian Region to show an increase in production over the 1944 volume. Accelerated production, which has been the trend for the past several years, has come about as a result of increased wartime demands, and it is quite probable that the post-war era of stimulated construction will result in continued heavy demands and accelerated cutting.

Available statistics reveal that since 1942, approximately 50,000,000 board feet of white pine have been converted into lumber products in the State. The stumpage value of white^{pine} is conservatively estimated at nearly \$500,000. The finished lumber products from this stumpage volume would be in the neighborhood of \$1,500,000.

The effects of accelerated cutting upon the blister rust control program as a whole have not yet been definitely determined. However, it is known that a considerable amount of reproduction occurs within many of the cut-over areas, and in many instances this reproduction will form a second growth of white pine which will contribute towards tomorrow's timbercrop. However, the opening of the forest stands which has accompanied the increased cutting, and the disturbance of the soil which attends logging operations will provide ideal growing conditions for ribes and will therefore call for alertness and stimulated activities of our control program. Young white pine is particularly susceptible to the attacks of blister rust, and therefore young stands of reproduction in cut-over areas should be kept under observance for several years, and ribes eradication programs placed into effect wherever necessary to give adequate protection from the spread of the disease.

Young white pine is undoubtedly becoming established as a component of forest acreage which has not supported appreciable quantities of this species in recent years. This spread of white pine is evidenced in the fact that white pine acreage in Pocahontas County, as revealed by surveys recently completed in that county, has increased from 42,049 acres as of 1937 to 56,698 acres as of 1945. This represents an increase of 34 percent within an eight year period. Similar increases have been noted in Greenbrier, Pendleton and Hardy Counties.

PERSONNEL EMPLOYED

No great amount of difficulty was experienced in securing the desired amount of labor for conducting blister rust control programs within the various counties during 1945. For the most part, our activities are confined to rural sections which are not highly industrialized, and employment by specialized industries does not afford a large amount of competition for the available labor supply.

The control program was conducted from a centralized headquarters at Marlinton, in Pocahontas County, and from branch stations located at Petersburg, Beckley, Parsons, and Frankford. Mr. G. C. Hamilton was in charge of the program in Pendleton Hardy and Hampshire Counties. The operations in Pocahontas, Greenbrier and Tucker Counties were supervised by Mr. D. L. Gilispie. Mr. G. E. Keaton handled the program in Raleigh County and also in four counties of eastern Kentucky.

During the peak of the eradication season, a total of 68 persons were employed, although the average for the entire year was only seventeen. During the summer months, youths of high school age were employed in some localities.

INFECTION CONDITIONS

A new center of infection was located in east/central Greenbrier County in the Rucker Gap vicinity during the summer. An examination revealed that the disease has been active in this section since 1935, but damage to white pine has been held to a minimum. Ribes were removed from and surrounding the Rucker Gap pine area in 1938 and again in 1945. It is expected that these two workings will give adequate protection to the pine for the next six to nine years without recourse to additional control measures.

In Pocahontas County, scattered infections are now known to exist within an almost continuous block covering about 50 square miles. However, the second working of that county is nearing completion and although some of the earlier infections are quite noticeable and have killed numerous trees, the spread of the disease has definitely been checked. Likewise, occasional pockets of infections are found rather frequently in Pendleton County, but the second working of that county is well under way, and the danger point for the present should be passed within the next two years, when a complete second coverage will in all probability be finished. Infections occur with less frequency in Hardy and Hampshire Counties.

In Raleigh County, diseased ribes bushes were found in three localities, but pine infection has not yet been discovered in that county. Ribes infections were also found in Mercer County during the year.

FIELD STUDIES

The field studies⁽¹⁾ were made in the State and the results condensed in the form of papers which were distributed quite widely as technical memoranda. The one study revealed the amount of damage occurring within an unprotected white pine area in Greenbrier County, and the other indicated the manner in which white pine is becoming reestablished in the forested areas of northeastern Greenbrier County, where white pine acreage is 54% greater than it was when a survey was conducted in 1936, 1937. Within the area studied, ribes suppression is being successfully achieved, since the paper indicates that the number of ribes per acre dropped from 20.5 bushes in 1936, 1937 (first working) to 5.8 bushes in 1944, 1945 (second working).

- (1) a. Damage From White Pine Blister Rust Within an Unprotected Area in West Virginia.
- b. Increase in White Pine - Decrease in Ribes Over an Eight Year Period in Greenbrier County, West Virginia.

NURSERY SANITATION AND QUARANTINE REGULATIONS

Mr. F. Waldo Craig, State Entomologist, inspected 25 privately owned nurseries within the State during 1945. The majority of these nurseries do not grow white pine in commercial quantities although all of them either grow small quantities of pine annually or have ornamental plantings established on their premises. At present, the largest producer of white pine in West Virginia is the State Forest Nursery at Lesage, near Huntington. Wild ribes do not grow in the vicinity of this nursery, which, in 1945 produced 272,223 white pine seedlings. The U. S. Forest Service Nursery at Parsons at one time produced large quantities of white pine seedlings, but during the war years, their production figures have dropped. However, future plans call for continuation of white pine seedling production, and a control program is conducted every other year in the environs of that nursery to suppress ribes growth. In 1945, a total of 94 ribes were destroyed.

The State Department of Agriculture received 217 requests for shipments of cultivated ribes into the State during the year. Permission for shipment was granted to 205 applicants, since the ribes were to be planted outside the range of native white pine. Refusal of permits was made to 12 applicants, who desired to plant ribes inside our well defined control areas.

TABLE III

COST OF CONTROL WORK IN 1945

Operating Agency	Amount Expended Jan. 1 - Dec. 31, 1945	Balance of Funds Available Jan. 1 - June 30, 1946
Bur. of Ent. & Plt. Quarantine. (3103)	7,020.46	5,303.28
State Conservation Commission	3,069.10	4,622.56
Total - Cooperative Forest Service	10,089.56	9,925.84
Monongahela Forest Service	8,682.49	2,628.25
George Washington	10,878.83	7,023.10
Total - Forest Service	19,561.32	9,651.35
TOTAL - ALL FUNDS	29,650.88	19,577.19

The average cost per acre of all control work in 1945 for ribes eradication, survey and post checking was 34¢.

RECOMMENDATIONS

In 1946 our plans call for completion of the resurvey programs in Greenbrier, Raleigh and Hardy Counties and partial completion of the resurvey in Monroe, Mercer and Hampshire Counties. By the end of 1947, we hope to have completed all necessary resurvey work and to be well along with the second eradication program, although it will in all probability be impossible to complete the second eradication over the entire State before the end of 1949 or 1950. In the year 1946, however, it will probably be possible to complete second workings within the George Washington National Forest and the Monongahela National Forest. Thereafter, the bulk of the work will be to protect privately owned pine.

It is also planned to complete a number of case histories for protected white pine areas falling in various watersheds throughout the State. These case histories will be of great value as an aid in guiding subsequent control work and will also be of value in stimulating more interest in the protective phase of timber management - especially on private and State lands.

Close cooperation must be maintained with the U. S. Forest Service and copies of various records, reports and maps will be turned over to this Agency which data will be available for incorporation in the Forest Service Timber Management plans.

GRAPH I

SHOWING PINE ACREAGE SURVEYED BY COUNTIES IN WEST VIRGINIA
(Through 1945)

Pendleton 70,221

Pocahontas 56,770

Greenbrier 41,767

Hardy 33,483

Monroe 29,667

Mercer 29,212

Summers 25,372

Raleigh 21,593

Morgan 8,755

Hampshire 6,689

Berkeley 3,734

Tucker 3,357

Total 330,620

(Scale - 1/10" = 1,500 Acres)

GRAPH II

SHOWING PINE ACREAGE SURVEYED BY OWNERSHIP
(Through 1945)

Private Land 256,071

Federal Land 67,063

State Land 7,486

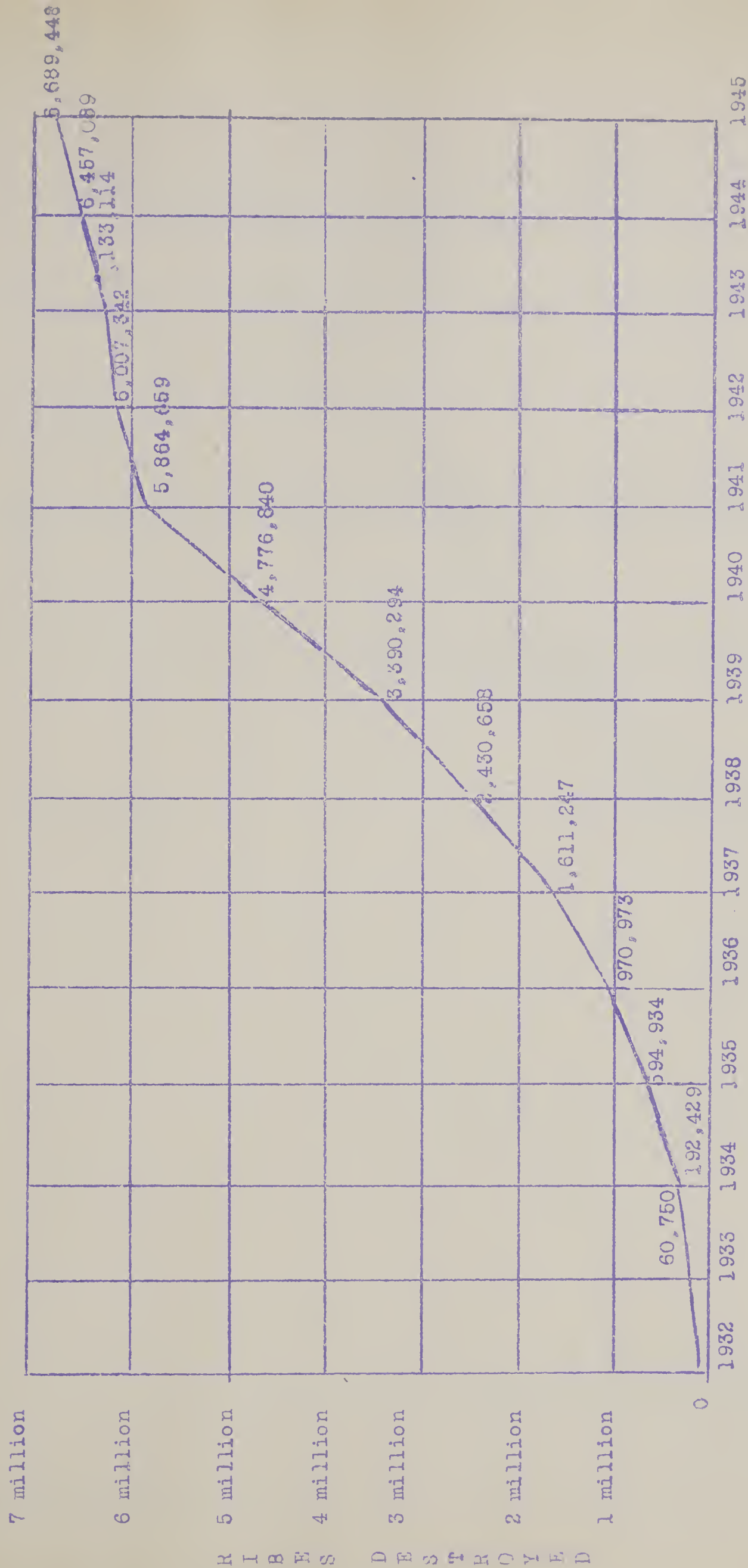
Total 330,620

(Scale - 1/10" = 7,500 Acres)

Surveys are virtually complete in all of the above counties, but additional pine acreage is known to exist in Ritchie, Wood, Wirt, Wetzel, Pleasants and some adjacent counties.

GRAPH III

SHOWING CUMULATIVE NUMBER OF RIBES DESTROYED BY YEARS - WEST VIRGINIA



GRAPH IV


AVERAGE ANNUAL PRODUCTION OF WHITE PINE LUMBER

IN WEST VIRGINIA - 1904 TO 1945
(By Decades)

1904-1909  25 Million B.F.

1910-1919  12.7 Million B.F.

1920-1929  3.3 Million B.F.

1930-1939  2.3 Million B.F.

1940-1945  9.3 Million B.F.

(42 year average)
1904-1945  9.2 Million B.F.

WHITE PINE BLISTER RUST

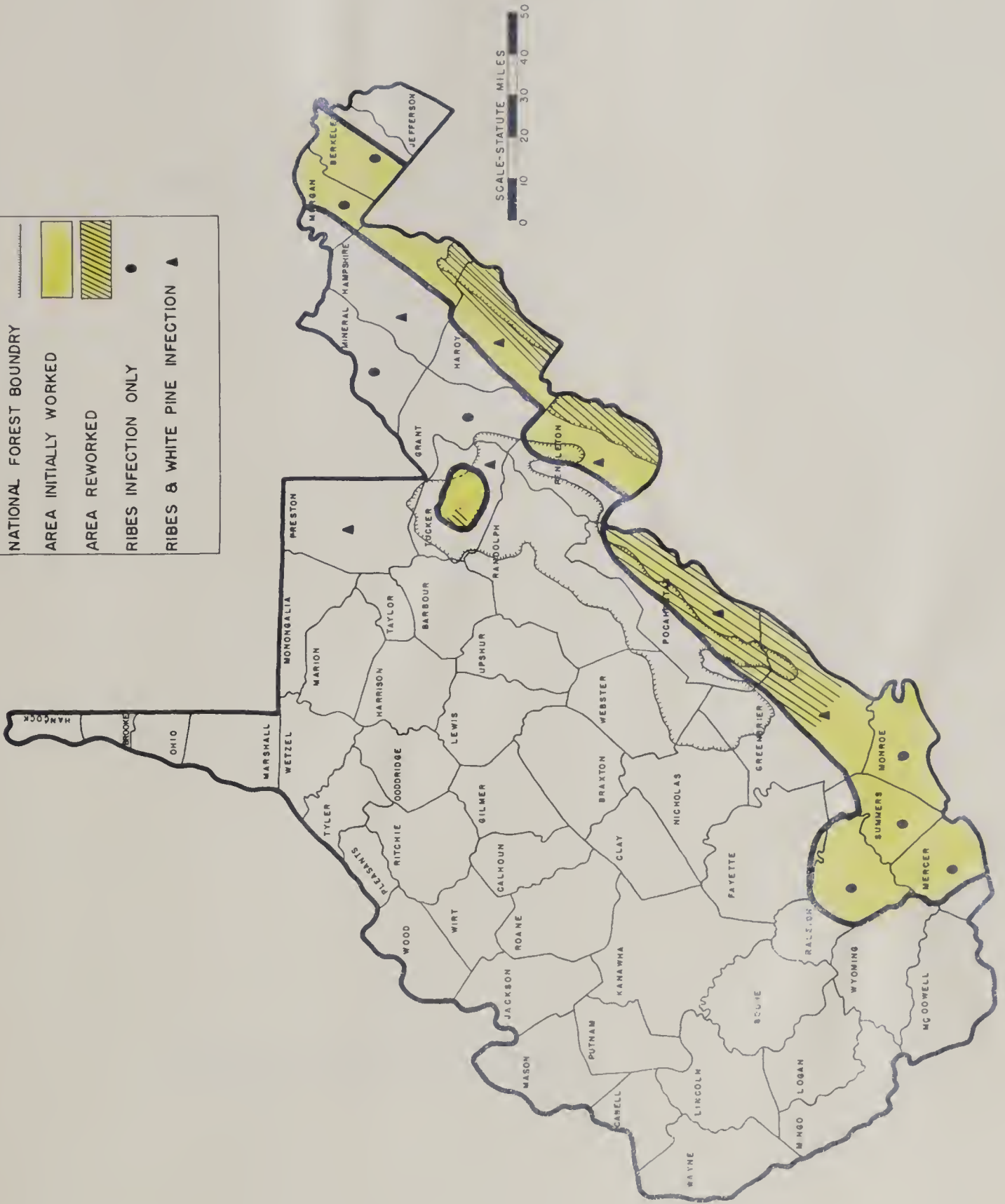
STATUS AS OF: DEC. 31 1945

STATE: WEST VIRGINIA

CONTROL STATUS MAP

LEGEND

CONTROL AREA BOUNDARY	—
NATIONAL FOREST BOUNDARY	----
AREA INITIALLY WORKED	■
AREA REWORKED	▨
RIBES INFECTION ONLY	●
RIBES & WHITE PINE INFECTION	▲



WHITE PINE BLISTER RUST CONTROL

IN THE

STATE OF KENTUCKY

1945

By

Ralph W. Welch, Area Leader

SUMMARY OF CURRENT YEARS WORK AND PAST WORKINGS

During 1945, a systematic survey of the white pine areas in the State of Kentucky was begun. Previously, estimates had been made at various times and the areas examined in a general manner, but up until 1945 a complete coverage had not been made in any part of the State. Although early examinations had established the fact that wild ribes and white pine are not usually found growing in close association, some evidence of such an association was found in certain localities. Therefore, it was felt that systematic surveys, checks and eradication (where needed) was necessary to insure protection from blister rust, especially since the presence of the disease is now known in virtually every State bordering Kentucky.

Kentucky's principal growth of native white pine is to be found along tributaries of the Red River in the eastern part of the State. Wolfe County in the center of the white pine belt, and probably as much as sixty to seventy percent of the native pine in the entire State is found within the boundaries of that county. White pine is also found native to several adjoining or nearby counties, such as Menifee, Powell, Lee, Morgan and Rowan Counties. Originally it is probable that the range of native white pine extended southward to the Tennessee line, and beyond, but early exploitation of the virgin timber was in many cases followed by devastating forest fires, and in more recent years white pine growth has been delimited to a much narrower range.

In 1934, blister rust control work was conducted throughout the white pine belt of the State. General scouting for ribes areas revealed the presence of wild ribes on one watershed (Chimney Top Hollow) in Wolfe County, where 2,093 bushes were found and destroyed. In addition, cultivated species of ribes, principally garden gooseberries and red currants, were found at 147 home sites within the white pine belt contiguous to Wolfe, Morgan, Menifee and Lee Counties, and 1,830 of these bushes were destroyed by permission of the owners. This first working, which was performed under the NRA (emergency) program, gave protection to an estimated 26,372 acres of white pine, through the examination of an estimated 61,523 acres of control area (white pine plus protective zone). A total of 628 man-days of labor were utilized in effecting the initial eradication program. In addition to the white pine acreage listed above, which included only those stands supporting at least 50 white pine stems per acre, it was estimated that 35,850 acres of scattered white pine was given at least partial protection from blister rust.

In years subsequent to 1934, inspections were made of several white pine plantations established on the Cumberland National Forest and on

private land by the Soil Conservation Service, thus increasing white pine and control acreage. The following table indicates the present status of the control program in Kentucky.

TABLE I

STATUS AND SUMMARY OF CONTROL WORK IN KENTUCKY

AS OF DECEMBER 31, 1945

: White	:	:	:	:	:	:	Per	:	:
: Pine	: Control	: Control	:Control	: Total	: Total	: Cent	: Acres	:	:
: Acreage	: Acreage	: Acreage	:Acreage	: Ribes	: Man-	: Initial	: of	:	:
: In Con-	: In	:Initially	: Re-	:Destroyed	: Days	: Work	: Main-	:	:
:trol Area	: State	: Worked	: worked	:	:	:Completed	: tenance	:	:
:	:	:	:	:	:	:	:	:	:
: 62,417	: 80,565	: 80,565	: 65	: 4,690	: 847	: 100	: 80,565	:	:
:	:	:	:	:	:	:	:	:	:

COOPERATION

The 1945 program was made possible through appropriations made by the U. S. Forest Service (Cumberland National Forest) and the Bureau of Entomology and Plant Quarantine. The Forest Service appropriation was utilized in April, May and June, and during the remainder of the calendar year funds were provided from a Bureau fund which was earmarked for blister rust control work on intermingled private and federal lands.

Cooperation was also afforded by the Kentucky State Entomologist, Professor W. A. Price, who works in connection with the University of Kentucky at Lexington. Mr. Price issued authorizations permitting agents of the Bureau to act as deputy inspectors under the provisions of the Kentucky Nursery Inspection Law. He also cooperated with respect to formulating a proposed revision of quarantine laws which may prohibit importation of cultivated ribes into white pine producing sections of Kentucky when the present survey has been completed, and the control areas definitely established.

TABLE II

SUMMARY OF RIBES ERADICATION IN KENTUCKY IN 1945

Agency	Acres		First Working			Second Working		
	Worked	Ribes	Ribes	Man-	Acres	Ribes	Man-	Days
	Free	Acres	Destroyed	Days		Destroyed	Days	
Bureau	0	0	0	0	65	749	10	
For. Service	0	0	0	0	0	0	0	
TOTAL	0	0	0	0	65	749	10	

TABLE III

SUMMARY OF SURVEY WORK CONDUCTED IN KENTUCKY, 1945

Agency	Control:		White Pine Acreage Mapped			Man-Days Survey	Acreage	
	Acreage	Examined	50 & Over	Under 50	Total White		Blocked	Out As
		Trees	Trees	Pine	Pine		Ribes Free	
Forest								
Service	3,840	1,500	1,629	3,129	41	3,840		
Bureau	40,960	7,809	9,093	16,902	160	40,895		
TOTAL	(1) 44,800	9,309	10,722	20,031	201	44,735		

(1) 23,509 acres federally owned, remainder State and private

(2) 12,928 acres federally owned, remainder State and private

WHITE PINE GROWTH AND PRODUCTION

The species grows well in eastern Kentucky and annual height growths of thirty six to forty inches are quite common on young stock. In fact, the largest white pine tree known at present in the entire Southern Appalachian Region is located within Natural Bridge State Park, Powell

County. This tree measures 48" DBH and is apparently in sound condition. Several others in the same immediate vicinity are almost equal in girth measurement.

In reviewing the available figures at hand indicating the production of white pine in Kentucky for the past forty years, the following table is presented as a part of this report:

TABLE IV
PRODUCTION OF WHITE PINE IN KENTUCKY

YEARS	PRODUCTION IN M.B.F.*
1906-1910	36
1911-1915	11
1916-1920	17
1921-1925	10
1926-1930	11
1931-1935	3
1936-1940	13
1941-1945	16
TOTALS	117

* Source of information: Forest Service
and Bureau of Census.

Due to accelerated demands for white pine in recent years a larger stumpage volume was cut in 1944 than in any year since 1907. It is very probable that demands will continue to be brisk for the next several years since it is anticipated that much lumber will be needed to satisfy the expanded construction program which is now being experienced.

There is much evidence indicating that white pine densities are increasing through natural seeding throughout Kentucky's white pine belt, and prospects for a good future crop of this species is bright. Recent surveys are turning up new acreages which have seeded into white pine within the past decade, especially within the purchase unit of the Cumberland National Forest where better fire protection is afforded. Young white pine reproduction is also noticeable in some sections of Natural Bridge State Park, and our most recent survey indicates the presence of 184 acres of white pine averaging 50 or more stems per acre on that Park, and 78 acres with less than 50 trees per acre.

In general, it can be stated that ninety percent or more of Kentucky's white pine is of the second growth class. It makes optimum growth in coves, hollows and along various water courses, being well adapted to moist locations with deep soils. Surveys indicate that it is replacing chestnut in many sections, in mixture with yellow poplar, which is another valuable forest species.

PERSONNEL EMPLOYED - 1945

The control program was conducted under the supervision of Mr. G. E. Keaton who had had five years previous experience in blister rust control work in West Virginia. Mr. Keaton was assisted by Mr. D. W. Johnson of Pine Ridge, Kentucky, who also had the benefit of previous experience, since he assisted in effecting the control program of 1934. A small crew of laborers were engaged and trained to do the survey and eradication program, and in spite of the roughness of the terrain of the territory covered, excellent progress was made.

TABLE V

COST OF CONTROL WORK IN 1945

:	:	Amount Expended	:	Balance of	:
:	Operating	January 1 thru	:	Funds Available	:
:	Agency	December 31, 1945	:	Jan. 1 - June 30, 1946	:
:	Bur. Entomology &	:	:	:	:
:	Plant Quarantine	\$ 1,621.32	:	\$ 1,928.68	:
:	:	:	:	:	:
:	Forest Service	846.60	:	--	:
:	:	:	:	:	:
:	TOTAL	\$ 2,467.92	:	\$ 1,928.68	:
:	:	:	:	:	:

RECOMMENDATIONS

Plans have been formulated which will allow for the continuation of the Kentucky blister rust control program in the 1947 fiscal year, and it is believed that all surveys and eradication work can be completed by the end of that year. Although only one ribes area has been located to date on the resurvey, it is too early to state that additional areas will not be found. However, it is reasonably sure that, with completion of the rework program now in progress, Kentucky's native stands of white pine

will be safe from blister rust invasion for at least another decade without the necessity of further expenditures.

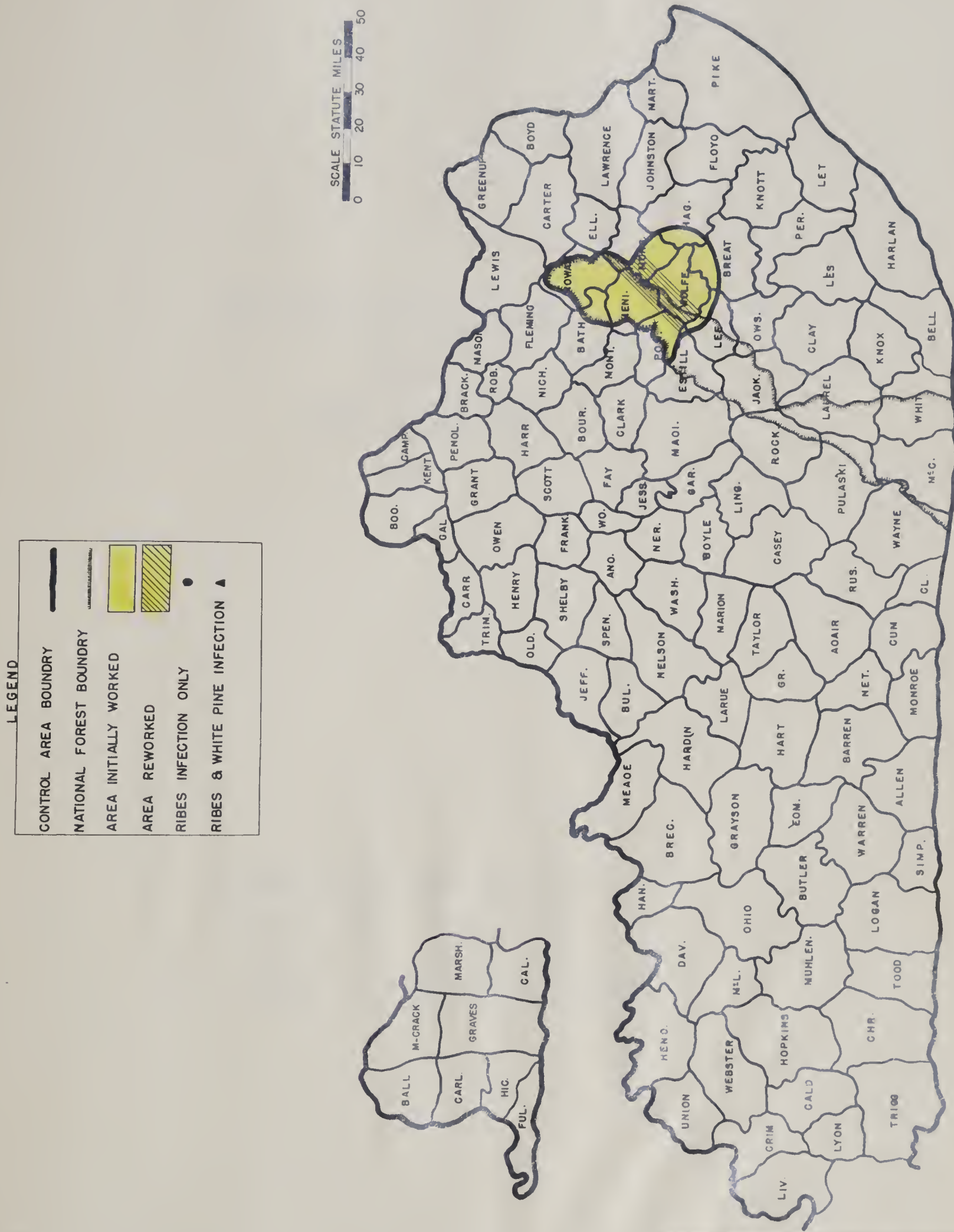
When the survey has been completed and the control areas more definitely delimited, recommendations will be made to the State Entomologist which will permit the drafting of future quarantine laws regulating the movement of cultivated ribes into areas where danger from spread of blister rust might be encountered.

WHITE PINE BLISTER RUST

STATE: KENTUCKY

CONTROL STATUS MAP

STATUS AS OF: DEC 31 1945



WHITE PINE BLISTER RUST CONTROL

IN THE

STATE OF TENNESSEE

1945

BLISTER RUST CONTROL AREA NO. 2

Ralph W. Welch - Area Leader

W. V. Zimmer - Assistant Area Leader

SUMMARY OF CURRENT YEAR'S WORK

Since a large part of the white pine blister rust control area within the boundaries of the State of Tennessee have been placed on a maintenance basis, the work program in 1945 was of a much smaller scope than in previous years. In the white pine belt which extends along the Cumberland Mountain range, a lesser percentage of the control area is on a full maintenance basis than in most other sections of Tennessee, and for the second year, our principle efforts were expended in effecting a second working of the ribes areas in that section. In Cumberland County a small crew of laborers were engaged in resurvey, post check and eradication activities from April through the remainder of the year. Although the size of the crew unit was quite small, a considerable amount of work was accomplished, and about 2,000 acres of valuable white pine was given protection from blister rust by the destruction of 11,835 ribes bushes which were found growing over 839 acres. Additional acreage was examined, but was found to be free of ribes growth. After the end of the eradication season, a 2-3 man crew continued with survey work in areas which had not been examined since 1937-1938, and in several sections they found considerable numbers of ribes, as well as pine acreage which is in need of initial protection from blister rust. Where adequate protection has been given from forest fires, it was noted that white pine is on the increase. In some localities, white pine has seeded in to areas which did not support an appreciable growth of this species when the initial eradication program was under way in 1937-1938, thus necessitating the expansion of control areas in some instances.

TABLE I

STATUS AND SUMMARY OF CONTROL WORK IN TENNESSEE
AS OF DECEMBER 31, 1943

White	(1)	(2)	Per	(3)
Pine	Control	Control	Total	Total
Acreage	Acreage	Acreage	Ribes	Man-
in Con-	In	Initially	Re-	Destroyed
trol Area	State	Worked	worked	Days
				Completed
				Work
				tenance
760,149	1,635,757	1,631,257	15,557	6,323,193
				47,019
				99
				1,599,778

- (1) 32,492 acres ribes-bearing, 1,598,765 acres free of ribes.
- (2) Ribes-bearing acreage only.
- (3) Acreage needing a minimum of attention within the next ten years.

COOPERATION

The control program in Cumberland County was made possible through the cooperation of the Tennessee Department of Conservation and the Bureau of Entomology and Plant Quarantine by a cooperative agreement which has been continuously in effect over a long period of years. Funds provided by the State were utilized to pay the salaries of a field supervisor and a crew foreman from April through December, and matching federal funds were used to pay wages and general operating expenses. Mr. Edward L. New is in charge of the Tennessee project, assisted by Robert Howard. The Tennessee State Entomologist and Plant Pathologist also cooperated in effecting the control program, especially through his efforts to control shipments of cultivated species of ribes into areas regulated by State and federal quarantine laws.

TABLE II

SUMMARY OF RIBES ERADICATION IN TENNESSEE 1945

:	:	:	:	:	:	:	:	:	:
:	:	Acres	:	FIRST WORKING	:	OTHER WORKINGS	:	:	:
:	AGENCY	Worked	:	Acres	:	Acres	:	:	:
:	:	Ribes	:	Ribes	:	Ribes	:	Ribes	:
:	:	Free	:	Bearing	:	Bearing	:	Destroyed	:
:	Bureau	:	:	:	:	:	:	:	:
:	&	:	:	:	:	839	:	11,833	:
:	State	:	:	:	:	:	:	:	:

WHITE PINE PRODUCTION

Production of white pine in Tennessee during the five year period extending from 1941 through 1945 amounted to 77,000,000 board feet. The production of white pine during this period is more than double the figure for the previous five year period, when only 33,000,000 board feet were produced, and more than five times greater than the production of the period 1931 - 1935. The following summary indicates white pine production figures for the State over a forty year period.

TABLE III

WHITE PINE PRODUCTION IN TENNESSEE

YEAR	PRODUCTION IN M.B.F.*
1906-1910	178,000
1911-1915	81,000
1916-1920	38,000
1921-1925	32,000
1926-1930	27,000
1931-1935	15,000
1936-1940	33,000
1941-1945	77,000
TOTAL	481,000

* Source of information: Forest Service and Bureau of Census.

From this table it can be deducted that the original exploitation of the virgin stands of white pine in Tennessee was nearing completion by 1910, and that, for the next twenty-five year period, production figures dropped sharply. In the next two decades, however, production increased considerably and in 1941 and again in 1944, more white pine was produced than in any year since 1912.

Late increases in production in all likelihood came as a direct result of the accelerated demands created by the nation at war. It is probable that the increases were made possible, at least in part, through the cutting of second growth pine, which has become of sufficient size since the harvesting of the virgin stand, as to now be of merchantable size. In the post war era there is little doubt that heavy demands will be created to meet the needs of expanded construction work, and it is very probable that production of white pine will continue on a rather high level for a number of years.

INFECTION CONDITIONS

Although blister rust infection is not yet known on the white pine host in Tennessee, it is pointed out that the disease was discovered on the ribes host in Johnson and Carter Counties, northeastern part of the State, in 1941. Since that time, a local area of infected white pine has been located in Ashe County, North Carolina, only a few miles east of the Johnson County line.

It is entirely possible that infections may exist in northeast Tennessee but since initial and partial second eradication programs have been completed in that section, it is extremely doubtful if commercial damage from the disease will be found as of this date. However, since the disease is definitely known to have spread as far south as Ashe County, North Carolina, vigilance must be maintained on our part to insure timely reworkings of ribes areas before the disease has had the opportunity to cause damage.

TABLE IV
COST OF CONTROL WORK IN 1945

Operating Agency	Amount	Balance of
	Expended	Funds Available
	January 1 thru December 31, 1945	January 1 thru June 30, 1946
Bur. Ent. & Plant Quarantine (3103.14)	\$2,068.03	\$3,143.26
State Conservation Commission	2,206.02	481.90
TOTAL	\$4,274.05	\$3,625.16

RECOMMENDATIONS

In 1946, our plans call for a continuation of the program in Cumberland County. A reconnaissance will be made of the adjoining County of Rowne to determine white pine and ribes conditions and a general check will be made to determine the necessity of conducting subsequent workings in Carter, Johnson and Sullivan Counties. In addition, representative sections of other counties will be examined to determine if white pine is seeding in new acreage which has not benefited heretofore from control operations.

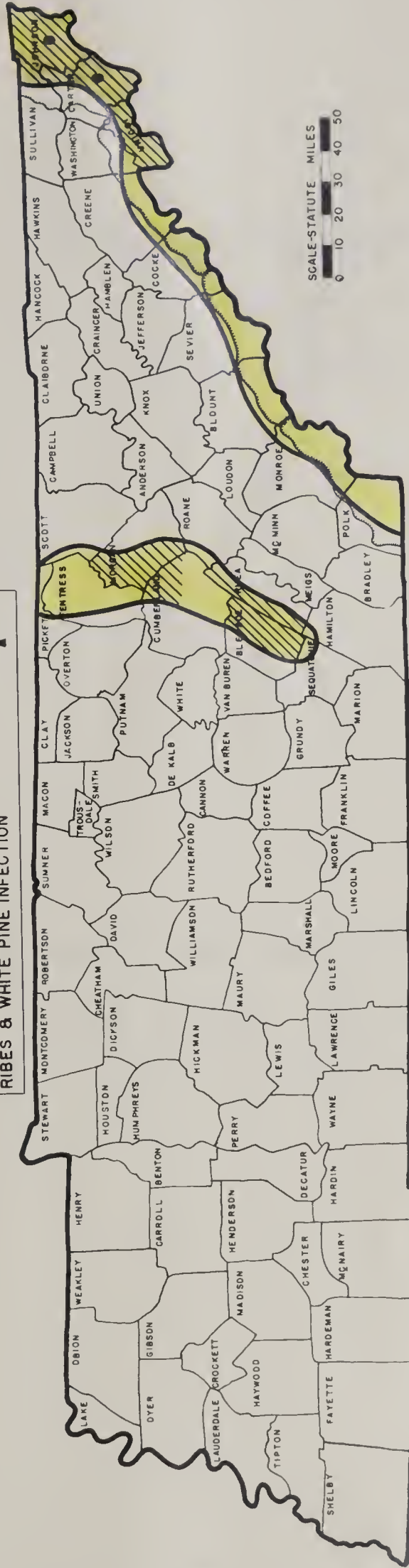
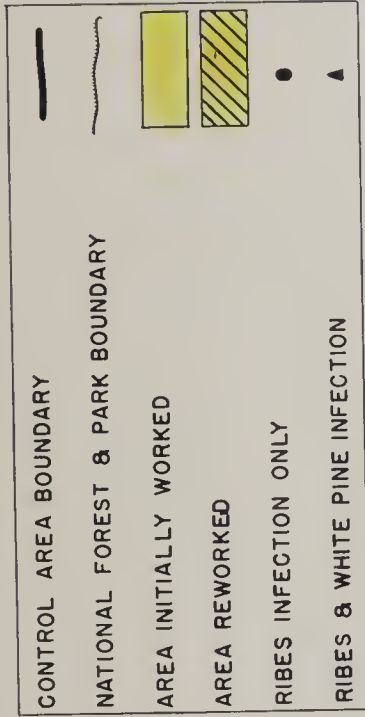
WHITE PINE BLISTER RUST

CONTROL STATUS MAP

STATE: TENNESSEE

STATUS AS OF: DEC 31 1944 YEAR

LEGEND



SCALE-STATUTE MILES
0 10 20 30 40 50

WHITE PINE BLISTER RUST CONTROL

IN THE

STATE OF GEORGIA

1945

BLISTER RUST CONTROL AREA NO. 2

Ralph W. Welch - Area Leader

W. V. Zimmer - Assistant Area Leader

SUMMARY OF BLISTER RUST CONTROL WORK IN 1945

The grid survey of white pine areas continued in the State during the calendar year of 1945. Good progress was made in the western half of the North-Georgia white pine belt. A total of 132,923 acres were surveyed, being an increase of 59,320 acres over 1944. Of this acreage 99,530 acres were Federally owned (Chattahoochee National Forest) and 33,593 acres privately owned. Within the control area 108,590 acres of white pine were mapped, 29,142 acres being privately owned and 79,448 acres Federally owned. The white pine acreage mapped included 18,752 acres with 50 or more stems per acre and 89,838 acres with less than 50 per acre.

The only ribes-bearing land found was on Federal land in the Chattahoochee National Forest in Towns County. This consisted of a one acre plot in Block #19, grid C-12 (See attached map) and 2-1/2 acres in Block #20-A, grid D" 23. The two areas were outside the protective zone and eradication work was not necessary. Thus, the entire control acreage examined was placed on maintenance which indicates that ribes growth is absent or of small consequence and that no additional work will be necessary for several years.

Post checks in 1944 revealed that it was necessary to rework Fort Mountain State Park in Murry County where ribes regeneration since 1938 and 1939 made a second and third working on some areas advisable. Four-hundred acres were worked by eradication crews and 32,418 ribes were destroyed. This work was not completed in 1944 as State and cooperative funds were exhausted for the year.

This project was resumed in 1945 and eradication crews worked 134 acres, destroying 12,637 ribes. One hundred twenty man-days were required. However, the Fort Mountain project was again discontinued before completion, this time due to the lack of fire protection. A series of maps of this area have been made showing fire damage to white pine and pine reproduction. After close study, a separate report will be made of this area. The results of this study will determine if further work is warranted. It seems at present that unless adequate fire protection is given that this project will be abandoned.

TABLE I
STATUS AND SUMMARY OF CONTROL WORK IN GEORGIA
AS OF DECEMBER 31, 1945

: White :	:	:	:	:	:	:	Per :	:
: Pine : Control :	Control :	Control :	Control :	:	:	Cent :	Acres :	:
: Acreage :	Acreage :	Acreage :	Acreage :	Total :	Total :	Initial :	of :	:
: in Con- :	in :	Initially :	Re- :	Ribes :	Man- :	Work :	Main- :	:
: trol Area :	State :	Worked :	worked :	Destroyed :	Days :	Completed :	tenance :	:
:	:	:	:	:	:	:	:	:
: 549,047 :	689,733 :	673,733 :	2,509 :	3,555,306 :	22,086 :	98 :	673,733 :	:
:	:	:	:	:	:	:	:	:

In the above table various adjustments have been made eliminating acreage and ribes on some areas which have been dropped due to low priority pine. In general, the bulk of the white pine growing lands in North Georgia are free of ribes since ribes in this section generally grow at a much higher elevation than does white pine. Thus, out of 673,733 acres initially worked to date only 2,483 acres are being held as ribes-bearing acreage within the protective zone.

TABLE II
SUMMARY OF RIBES ERADICATION IN GEORGIA IN 1945

:	Acres :	:	:	:	:	Other Workings :	:
:	Surveyed :	:	First Working :	:	:	:	:
:	Ribes- :	:	:	:	Man- :	Ribes :	Man- :
:	Free :	Acres :	Destroyed :	Days :	Acres :	Destroyed :	Days :
:	:	:	:	:	:	:	:
: Bureau & State :	:	:	:	:	:	:	:
: (State and Private :	33,593 :	33,593 :	- :	408 :	134 :	12,637 :	120 :
: Lands) :	:	:	:	:	:	:	:
: Forest Service :	:	:	:	:	:	:	:
: (Chattahoochee :	99,330 :	99,330 :	- :	1,015 :	- :	- :	- :
: National Forest) :	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:
: TOTAL :	132,923 :	132,923 :	- :	1,423 :	134 :	12,637 :	120 :
:	:	:	:	:	:	:	:

Control work of one type or another was conducted in the following counties during the year: Rabun, White, Murray, Towns, Habersham, Lumpkin and Union. Camps from which crews operated were maintained in Union County at two different locations, first, at Lake Winfield Scott and later at Unicoi Gap.

An eight to ten man crew was engaged in re-eradication on State land in Murray County, Fort Mountain State Park and 134 acres of ribes-bearing land was covered from which 12,637 wild ribes were destroyed, utilizing 120 man-days. A chemical mixture consisting of salt and borax was used where necessary on roots and crowns deeply embedded in rocky places to prevent future sprouting.

From surveys, it was determined that only two grids in Towns County contained small areas of wild ribes located on Federal land in the Chattahoochee National Forest. In Block "20-A, grid D"23, 84 bushes with 674 estimated feet of live stem were found in the vicinity of Henson Gap. This ribes area covered approximately 2-1/2 acres. In Block #19, grid C-12, 28 bushes with 360 estimated feet of live stem were located in the vicinity of Tray Mountain; approximately 1 acre ribes-bearing. These areas will need no eradication at the present time and will present no problem until pine reproduces within the protective zone. These areas are being added to others for future checking and consideration.

It is expected that we will be able to complete the survey and place Georgia on a full maintenance basis soon after the first of the new year. We have corrected and revised all permanent control records, adjusting many old estimated figures and brought records up to date. It is estimated that the small acreage remaining at the end of 1945 will be completed in one to three months, at which time office and extensive work in Georgia will be discontinued.

Quarantine Regulations:

A tentative revision of quarantine laws restricting the shipment of ribes into pine areas was completed and submitted in 1944. Under the revised regulations, restricted areas will include only those post offices within pine growing areas and not entire counties as a whole, as has been the case previous to the revision. The new regulations are still under consideration.

Labor:

The labor situation has improved during the year. We have been able to secure our quota of men for both Forest Service and Bureau projects. However, we were still unable to secure a sufficient number of men in all required sections, and base camps have continued to operate as the most logical way of working areas where sufficient local labor was not available. Several veterans have been employed but are not with us at the present time. It has been our policy to give preference to veterans when interviewing men for employment. Our turnover has been small due to camp operations which enabled us to keep well-trained crews in the field. As in the past, we have continued to grant leave of absence seasonally to men for agricultural purposes.

COOPERATION

Control work was carried on with the same cooperating agencies as in the past, that is, the U. S. Forest Service, Georgia State Department of Entomology and the Bureau of Entomology and Plant Quarantine. Funds allotted by these three agencies throughout the past several years have made it possible to place virtually the entire State on a full maintenance basis.

WHITE PINE

As of the end of 1945 a total of 537,047 acres of white pine and 673,733 acres of control area have been mapped or examined in Georgia. It is estimated that 12,000 acres of white pine and 16,000 acres of control area remain to be mapped. Most of the pine mapped to date is young growth with 75 to 80 percent being four inches or less in diameter. The distribution is quite wide and general with stockings varying from 50 stems per acre to well over a thousand stems per acre. Under fire protection white pine is doing exceptionally well in North Georgia, and reproduction is rapidly spreading in many sections, increasing the acreage greatly. To date blister rust infection has not been found in the State on either loblolly or white pine.

Sawmill activities continued at an accelerated pace during the year with white pine again receiving an abnormally high cut. Figures on the cut of white pine on Federal and private lands by board feet have not yet been made available, but it is probable that increased war-time demands have caused production figures to increase. No new pine plantations have been established during the year. White pine is noticeably replacing cutover hardwood stands and dead chestnut areas at the rate of from 1,500 to 2,000 stems per acre in some cases. Five to ten years ago the greater part of this acreage would have been classified as non-pine area. The abundance of young pine that is found coming in on cutover areas gives every reason to believe that Georgia can look forward to a large increase in white pine acreage in the next ten to twenty years.

PERSONNEL EMPLOYED

Our crews during the year have consisted of eight to ten men, with a peak of twenty employees during the summer. At that time two crews were in operation, one re-eradication crew on Regular and State funds and one survey crew on Forest Service funds.

Field supervision continued under the direction of Fred W. Hall assisted by Andrew J. Davis, jr., Miss Margaret L. Simmons continued as clerk-stenographer in the Dahlonega office.

FIELD STUDIES

Survey crews continued to run four strips per grid on poor or scattered pine areas and on unlikely ribes areas at low elevations. This method, however, calls for close checking by Supervisor or Foreman from the standpoint of being sure that the men understand the importance of off-setting from their lines and examining all old fields, abandoned house sites, as well as rocky coves and other likely places for the presence of ribes. By using natural boundaries such as roads, streams, etc. we have eliminated running of some control lines and still have maintained accuracy. This enables us to save man hours and gives us a large acreage coverage.

All study plots have been abandoned with the exception of one plot (*Ribes Curvatum*) located in Murray County, Fort Mountain State Park. This plot afforded additional information for study and observation this year as the entire area was burned over in early spring by an extremely hot ground fire. Thousands of ribes seeds germinated shortly after the fire.

TABLE III

COST OF CONTROL WORK IN 1945

COOPERATIVE FUNDS				FEDERAL FUNDS			
		Total		Entomology &			
Direct	In-	Coopera-	Plant Quarant-	Forest	Total	Total	
Aid	direct	tive	time	Service	Federal	All	
	Aid	Funds	3101 3103		Funds	Funds	
1,449.14	720.00	2,169.14	5,354.67	2,139.22	10,536.51	18,030.40	20,199.54

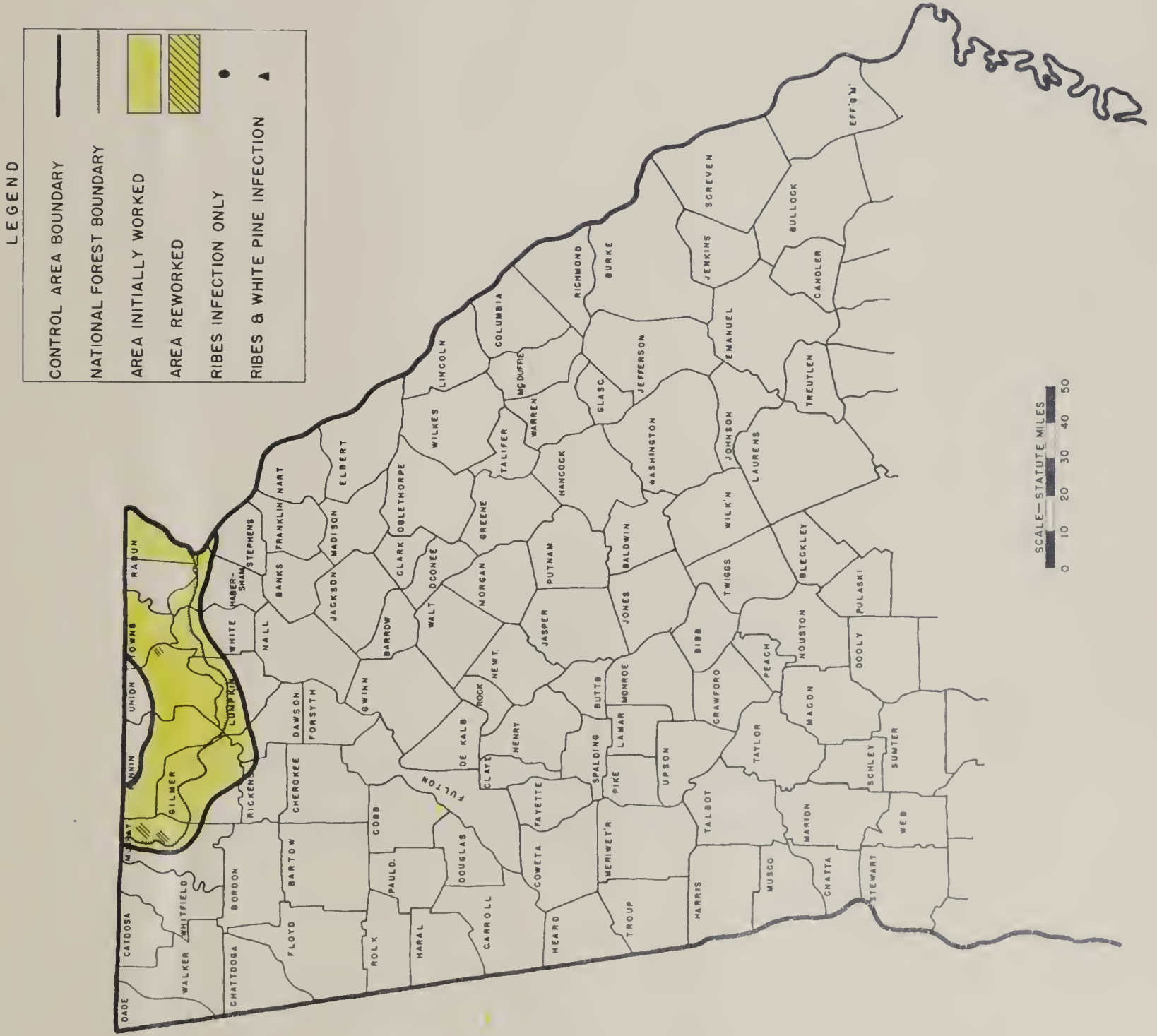
RECOMMENDATION FOR FUTURE WORK

Completion of the small amount of remaining acreage by grid system survey is recommended, after which the Dahlonega office will be closed. Within the next several years, only a minimum of control work will be necessary and this work will be confined to periodic checking of areas where danger from the spread of blister rust may exist.

Periodical checks at intervals of ten years or so may be made to determine increase or decrease of pine acreage and growth and expansion of ribes territory. To date no infection has been found in the State either on ribes or pine, but continued vigilance is recommended.

An occasional check on cultivated ribes should be made, to insure a minimum of danger from this source of infection.

Personal contact will be maintained with the State Director of Entomology from time to time, keeping him informed as to any changes occurring in the status of control problems within the State.



PART V

Work Project BLR-4

Detailed Reports on Blister Rust Control on
National Forests - 1945

By

Henry E. Yost, P-3, Area Leader, Area No. 1

H. B. Teague, P-2, Assistant Area Leader

Ralph W. Welch, P-3, Area Leader, Area No. 2

W. V. Zimmer, P-2, Assistant Area Leader

WHITE PINE BLISTER RUST CONTROL
IN THE
GEORGE WASHINGTON NATIONAL FOREST
1945

H. E. Yost Area Leader Blister Rust Control, Area No. 1

R. W. Welch, Area Leader Blister Rust Control, Area No. 2

STATUS OF CONTROL

During the year survey work was carried on in the Dry River, Lee, Deerfield and Warm Springs Ranger Districts. Eradication was carried on for the most part in the Dry River District with a small amount of work in the Lee, Deerfield and Warm Springs Districts. At present the resurvey is practically completed in that part of the Dry River Ranger District in Virginia, and entirely complete in West Virginia. It is completed for the Deerfield Ranger District except for that part in Rockbridge County. A relatively small percentage of the Warm Springs Ranger District is resurveyed. The work was begun in the northeastern part of Bath County. About 50 grids remain to be surveyed in the Lee District, Hardy and Hampshire Counties, West Virginia.

The following table shows the status as of December 1945. In the case of Virginia there is a slight reduction in both white pine and control acreage. The reason for this is that up to the end of 1944 a considerable amount of adjacent and intermingled private lands were regarded on our records as being Federal ownership. This acreage was reclassified during the year and includes only that part which is actually owned by the Forest Service.

In West Virginia, white pine acreage has increased by about 25 percent over previous figures. This gain is evidenced particularly in Pendleton County.

TABLE I

STATUS AS OF DECEMBER 31, 1945
ACTUAL OWNERSHIP

		: Control:	Control	:Control:	Per Cent:	Acreage:
	: Acres White:	Acreage	: Acreage	:Acreage:	Initial:	On
State	: Pine In	: In	:Initially:	Re-	Work	Mainte-
	:Control Area:	Forest	: Worked	:worked	:Completed:	nance
West Virginia:	26,006	: 49,188:	49,188	: 8,417:	100	: 30,692:
Virginia	: 103,301	: 224,309	204,361	: 40,713:	91	: 132,592:
TOTAL	: 129,307	: 273,497:	253,549	: 49,130:	93	: 163,284:

In doing survey or ribes eradication work it is necessary that some private holdings which are adjacent to, or intermingled with, Federal holdings be worked in order to clear a zone some 900 feet in width surrounding Federal owned pine. In many cases intermingled private holdings consist of a narrow strip of land along the stream bottom, no part of which is over 900 feet from Federal holdings. Therefore, in the following table dealing with eradication there is a considerable difference in the number of acres worked by Forest Service crews and that actually owned by the Forest Service.

SURVEY

During the year 80 grids, or square mile units, were surveyed by Forest Service crews in Virginia and 87 in West Virginia. The rate of coverage and the methods used were much the same as those described in last year's annual report. In the past the white pine count on survey was taken in total regardless of diameter class. When the survey was completed for a particular grid an estimate was made of the percentage of the trees under 4", from 4" to 12" and over 12" DBH. In 1945 the procedure was changed whereby the count was made separately of each diameter class. The average rate of coverage on survey was 75 acres per man day.

The grid survey on the George Washington National Forest is necessary in order to determine the present status of white pine and ribes conditions on the forest. Without good maps and records we would be unable to formulate comprehensive work plans.

TABLE II

WHITE PINE RESURVEY BY THE GEORGE WASHINGTON NATIONAL FOREST - 1945

State	Acres W. P. Mapped	Control Acres Mapped	Approximate Per Cent Resurvey Complete
West Virginia	11,181	42,760	75
Virginia	16,145	38,858	50
TOTAL	27,326	81,618	62.5

RIBES ERADICATION

The following two tables give a resume⁹ of the eradication work performed with Forest Service Funds and the acreage covered on Forest Service land. The heaviest ribes concentrations were found in and near the headwaters of Long Run in the Dry River District. Most of the work was second coverage and, therefore, the bushes were relatively light. In many cases it was necessary to determine whether it was initial or reworking by estimate since the old original pine and control areas cannot be re-established on the ground. The following figures, therefore, should not be used as a guide for ribes per acre for first and subsequent workings. During most of the eradication season it was necessary to carry on the work in those localities where manpower was available, therefore, it was impossible to concentrate on any particular ranger district or section of a district. During the latter part of the eradication season the manpower situation improved materially. The unusually early spring and late fall gave us probably the longest eradication season since the beginning of the work in the forest

TABLE III

SUMMARY OF RIBES ERADICATION BY FOREST SERVICE ON GEORGE WASHINGTON NATIONAL FOREST (1) 1945

State	Acres Covered	Ribes Free	Ribes Bearing Worked	Acreage Total	Ribes Des- troyed	Man- Days Used	Approximate Acreage Ribes Bearing To Be Worked
West Virginia	320	200	3,562	3,762	89,705	1,162	4,000
Virginia	-	834	15,855	16,689	753,945	4,670	20,000
TOTAL	320	1,034	19,417	20,451	843,650	5,832	24,000

(1) All work by Forest Service crews, (includes some intermingled lands).

TABLE IV

ACREAGE WORKED ON GEORGE WASHINGTON NATIONAL FOREST (1) - 1945

State	Acres Covered Ribes Free	Ribes-Bearing Acreage Worked		Total Acres Worked
		Initial	Rework	
West Virginia	320	200	2,550	3,070
Virginia	11,204	815	14,533	26,552
TOTAL	11,524	1,015	17,083	29,622

(1) Work by Forest Service and Bureau crews, Forest Service lands only.

CHECKING

During the year 19,370 of the 20,451 acres worked by eradication crews were checked. The difference was accounted for by the fact that the last eradication work performed in the fall is not checked until the following spring. In virtually all cases it was found that practically all crews were doing satisfactory work and only a small amount of rework was necessary. All checking was based on 5 percent coverage and required 248 man days.

STATUS OF THE BLISTER RUST ON THE GEORGE WASHINGTON NATIONAL FOREST

The following description of the situation relative to the blister rust reflects the situation as based upon our present knowledge. It is believed to be reasonably accurate for the Dry River, Deerfield, and Warm Springs Districts. The same is true of that part of the Lee District in West Virginia. Very little work has been carried on on the Lee District in Virginia for several years. The report with respect to the Pedlar Ranger District is incomplete since it represents findings on a few general scouting trips and also more intensive work along the Blue Ridge Parkway. Resurveys and post checks are scheduled for the Pedlar District in 1946 or early 1947.

Lee Ranger District

Probably a few scattered white pine infections are present along the Virginia-West Virginia line. None are known in the Massanutten Mountain range. The total extent of the damage is believed to be negligible.

Dry River Ranger District

The rust has been present on this District since about 1932. It is now generally distributed. Fairly heavy damage has taken place in scattered stands of white pine along the crest of the Shenandoah Mountain where the ribes are abundant but the pine is of insufficient value to justify protecting it.

Deerfield Ranger District

The situation as described for the Dry River Ranger District would apply likewise in the northern part of Augusta County and, to a lesser extent, along the same mountain range on the Augusta-Highland County line. Farther south in Augusta County, and in that part of the Ranger District lying in Rockbridge and Bath Counties, very little rust is known to be present. Very little damage has occurred in western Highland County except for a small plantation at Locust Springs around which the ribes were so abundant that control efforts were discontinued because of the high degree of infection already present.

Warm Springs Ranger District

Two rather extensive centers of infection are known to be present; one in the vicinity of Hot Springs and the other in Rucker Gap. Undoubtedly other scattered infections are present in this district but it is believed that very little will be found in Alleghany County and southeastern Bath County.

Pedlar Ranger District

This District is, for the most part, ribes-free and, therefore, very little rust is present. In the course of control work along the Blue Ridge Parkway it was found scattered, in a spotted manner, along the section about two miles in length in the vicinity of Montebello and Norvell Flats. It is probable that other infections are present since this one apparently originated about 1934.

For the Forest as a whole, a very high degree of control has been maintained although in a few small localities very heavy damage has occurred.

We feel that with the next ten years ribes eradication will progress to the point where we can definitely hold the rust in check on the better white pine stands of the forest. Under proper timber management, whereas a fairly closed canopy is maintained and with periodic inspections made for ribes regeneration and reworking when necessary, we should be able to keep rust damage down to the minimum.

It is planned to conduct a systematic disease survey in the spring of 1946 which should furnish us with reliable information on the spread and intensity of the rust.

COSTS

The following table shows the cost of control work in 1945. The total expenditures during the year exceeded by about \$6,000 that for 1944. This is accounted for because of the long eradication season and slightly higher wage rates. Effective July 1, laborers were granted 2-1/2 days per month annual leave, which likewise increased the total expenditures as well as the average man-day cost.

TABLE V

SUMMARY OF EXPENDITURES BY GEORGE WASHINGTON NATIONAL FOREST 1945

State	Labor	Superv'n & Operation	Total	Cost Per Acre [*]	
				Eradication	Survey
West Virginia	\$ 8,015.52	\$2,863.31	\$10,878.83	\$1.85	\$0.05
Virginia	27,171.43	4,908.77	32,080.20	1.44	0.16
TOTAL	\$35,186.95	\$7,772.08	\$42,959.03	\$1.51	\$0.07

* Per acre figures include labor and operating costs.








WORK SCHEDULE FOR 1946

During 1946 we plan to provide for continuing the survey on the Warm Springs and Lee Ranger Districts. It is not likely that the survey will be completed in the former district in one year. At the present rate, however, it should be completed by the spring of 1947. It is hoped that the survey can be completed on the Lee Ranger District during 1946. A small amount of work has already been done in the southern end of the Lee District in Virginia, and a considerable amount of resurvey has been completed in Hardy County, West Virginia. That part of the Lee District lying in Rockingham County, Virginia, has been covered and found to contain practically no white pine on Forest Service holdings. It is hoped that available funds for labor will make possible completion of the re-eradication work in the Dry River Ranger District in both States. It is impossible to make an accurate estimate of this since a large percentage of the district was surveyed in 1940 and 1941 and will need to be post checked before the eradication needs can be accurately estimated.

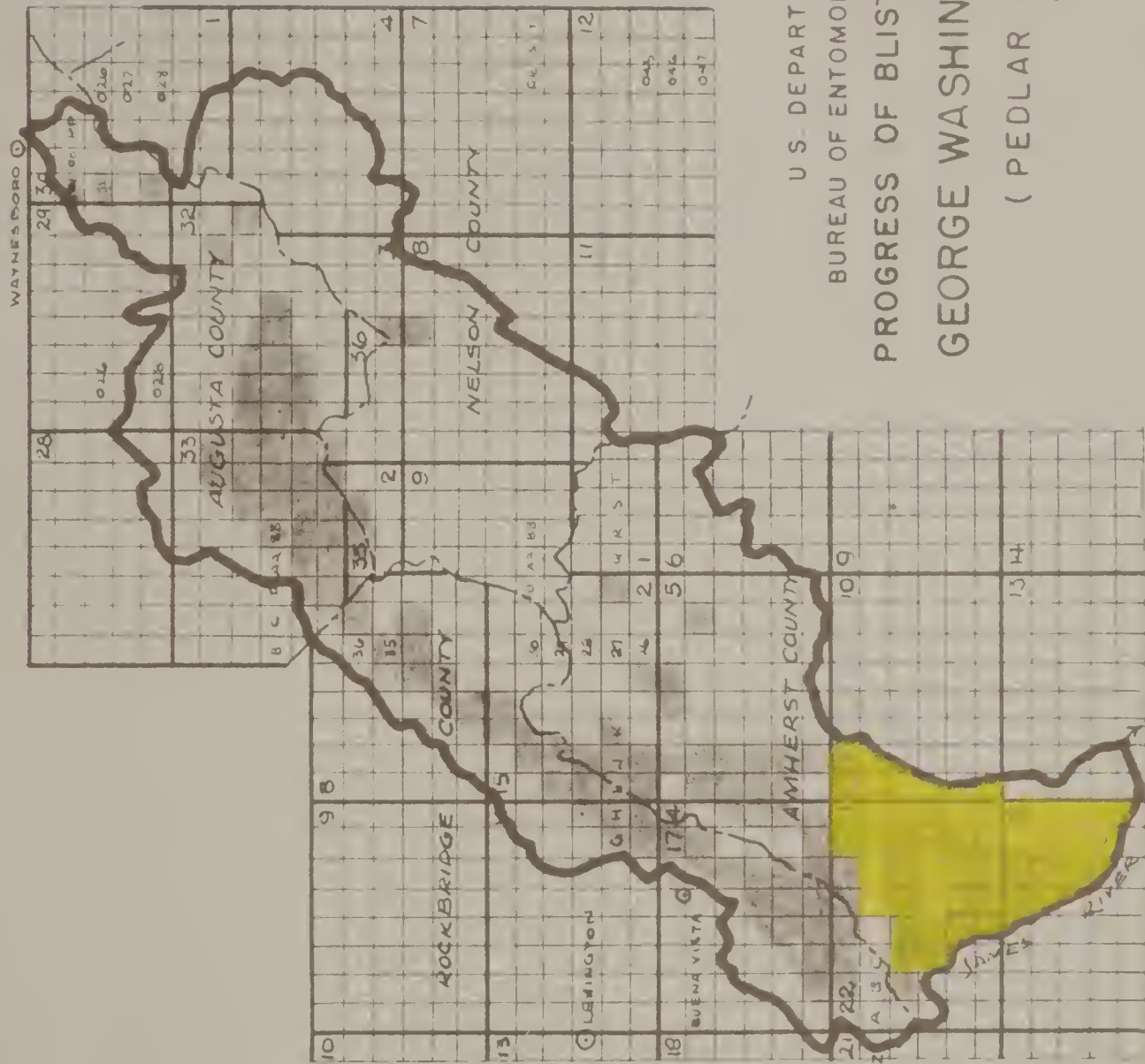
At the present rate, survey for the forest can likely be completed by the end of 1947. This, of course, will depend not only on funds but the percentage of the funds which are spent on eradication. There is to date a sufficient amount of ribes-bearing land surveyed to use the entire annual allotment on eradication but it is considered desirable to complete the survey and post checking as soon as possible, because it is from our surveys and post checking which determines the priority of working white pine areas.

The following progress maps show the status and general location of blister rust control work performed on the George Washington National Forest.

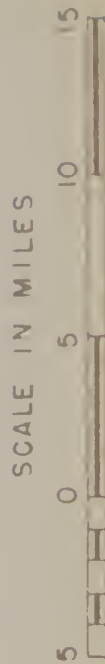
LEGEND

-  FOREST BOUNDARY
-  AREA WORKED INITIALLY
-  AREA REWORKED
-  AREA ON MAINTENANCE
-  FEDERAL LAND
-  Ribes Bearing Land on Maintenance
- 

NOTE: GRID NUMBERS SHOWN ON COUNTY INDEX MAPS.

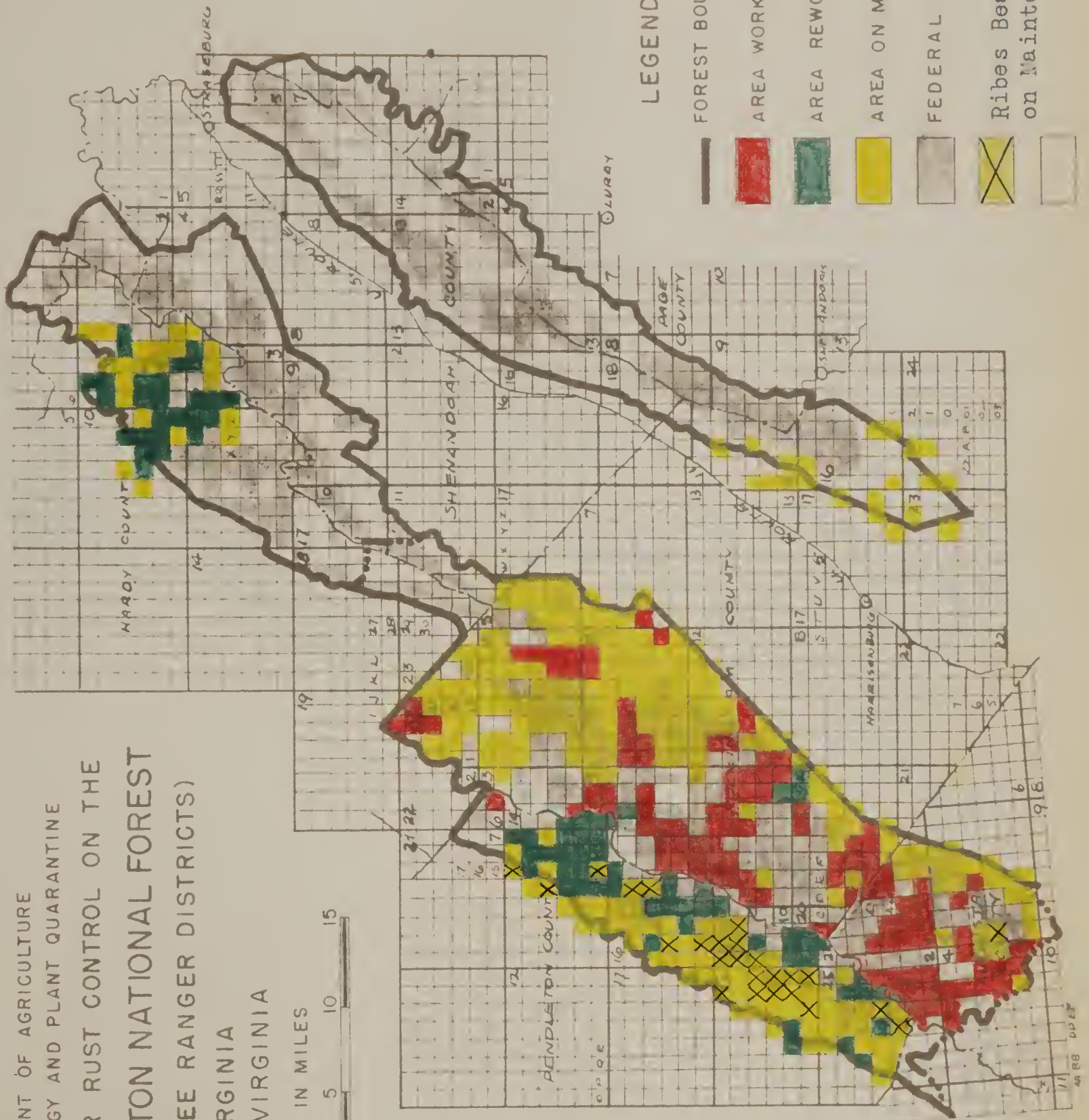
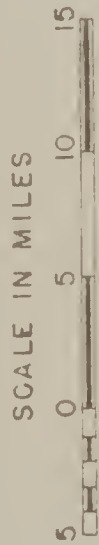


U.S. DEPARTMENT OF AGRICULTURE BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE PROGRESS OF BLISTER RUST CONTROL ON THE GEORGE WASHINGTON NATIONAL FOREST (PEDLAR RANGER DISTRICT) VIRGINIA



US DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
GEORGE WASHINGTON NATIONAL FOREST
(DRY RIVER AND LEE RANGER DISTRICTS)

VIRGINIA
WEST VIRGINIA



LEGEND

- FOREST BOUNDARY
- AREA WORKED INITIALLY
- AREA REWORKED
- AREA ON MAINTENANCE
- FEDERAL LAND
- Ribes Bearing Land on Maintenance

NOTE: GRID NUMBERS
SHOWN ON COUNTY
INDEX MAPS

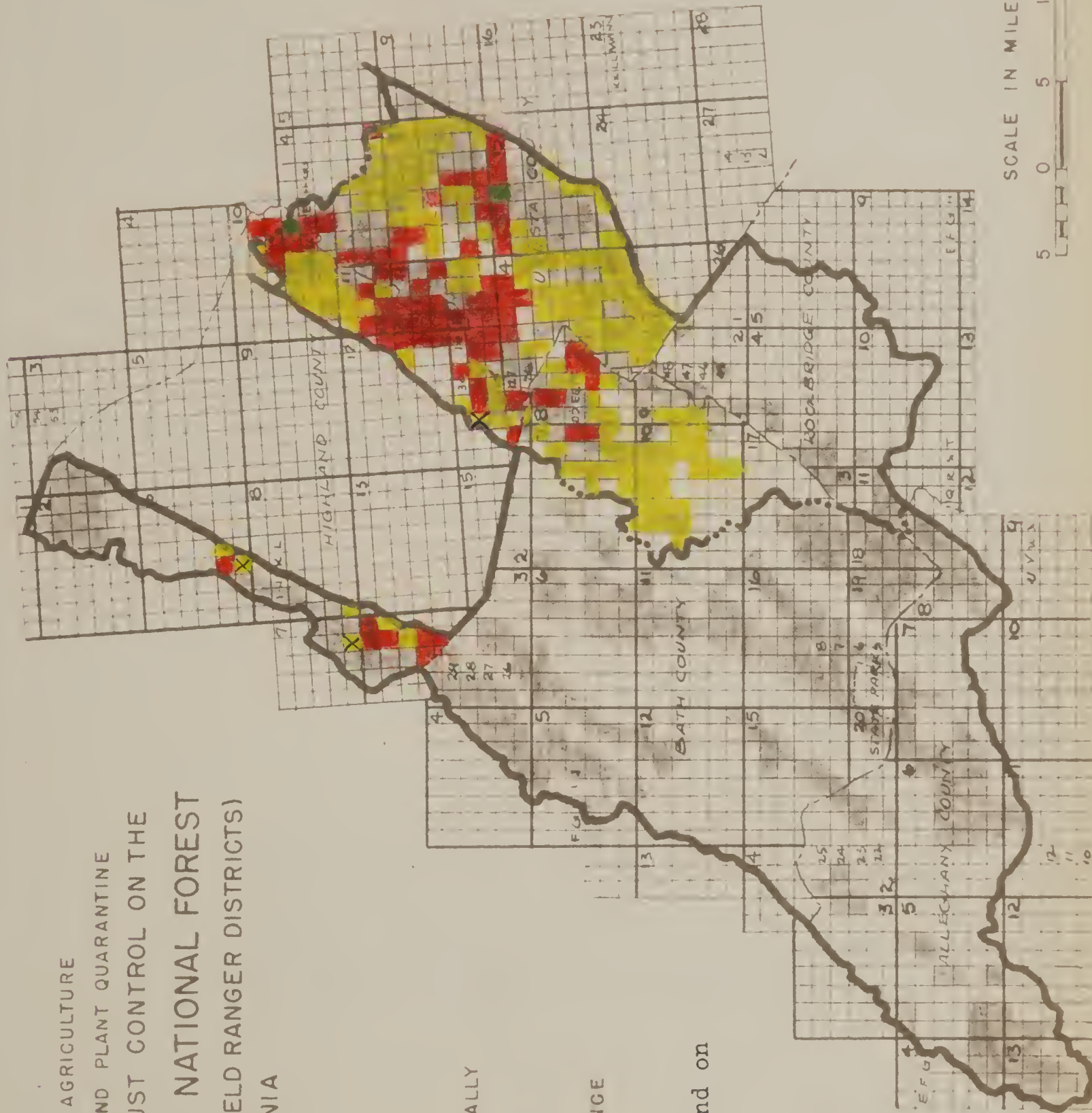
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
GEORGE WASHINGTON NATIONAL FOREST
(WARM SPRINGS AND DEERFIELD RANGER DISTRICTS)
VIRGINIA

LEGEND

- FOREST BOUNDARY
- AREA WORKED INITIALLY
- AREA REWORKED
- AREA ON MAINTENANCE
- FEDERAL LAND
- X

 Ribes Bearing Land on Maintenance
-

NOTE: GRID NUMBERS
ON COUNTY INDEX
MAPS



SCALE IN MILES
0 5 10 15

WHITE PINE BLISTER RUST CONTROL

IN THE

JEFFERSON NATIONAL FOREST

1945

BLISTER RUST CONTROL AREA NO. 1

Henry E. Yost - Area Leader

H. B. Teague - Assistant Area Leader

STATUS OF CONTROL

The status of white pine survey by Ranger Districts is briefly described as follows:

Glenwood Ranger District - Survey completed in 1943.

New Castle Ranger District - A small amount of resurvey has been done in Botetourt County in the northeastern end of the district. No other survey work is scheduled until after 1946.

Wythe Ranger District - Most of the survey is completed or scheduled for completion during 1946. A small amount of work remains in Grayson, Carroll and Wythe Counties. None has been carried on in any of the other counties.

Holston Ranger District - The survey is believed complete although that part of the district lying in Bland County has not been examined. Possibly some white pine is present. This should be completed during 1946.

Clinch Ranger District - No white pine is known to be present.

By the end of 1946 the survey should be completed, or for the most part completed, on all ranger districts except the New Castle. At the present rate New Castle can probably be completed by the end of 1947.

STATUS OF RIBES ERADICATION

Glenwood Ranger District - Eradication was completed in 1943. No additional work will be needed for perhaps two or three more years when a post check should be made to determine its status.

Holston Ranger District - All second ribes eradication completed except that portion of the district which falls in Wythe County.

Wythe Ranger District - Some eradication was carried on in the southwestern portion of the district.

New Castle Ranger District - Nothing has been done at the present time.

The present indications are that there will be very little eradication work carried on in the spring of 1946 due to a shortage of funds. However, it is hoped that some additional funds may be available for transfer from some other forest.

STATUS OF THE RUST

Previous to 1945 the rust had been found on pine in one location in Alleghany County and at another along the Roanoke-Montgomery County line. One isolated infection was found in Giles County. The rust had been found on ribes in every white pine county on the forest except Carroll. During the spring of 1945 a single white pine tree was found infected near White Top Post Office on privately owned land. This infection was believed to have originated about 1942. Later in the summer an infection was found on Federally owned land near the crest of the mountain between Buzzards Knob and Comer's Rock. This infection evidently occurred in 1943 and covered about one acre. There were 36 percent of the trees infected and 661 branch cankers were cut. This is an unusually heavy infection for only one years development, however, it shows what can happen under favorable conditions. During the fall an infection dating back to about 1936 was found in Ashe County, North Carolina, some 10 miles south of the junction of the Tennessee, North Carolina and Virginia lines. With so old an infection in the general vicinity it appears reasonably certain that there are other infection centers in southwestern Virginia. The following table shows the status of control as of December 31, 1945:

TABLE I

STATUS OF CONTROL AS OF DECEMBER 31, 1945
JEFFERSON NATIONAL FOREST
ACTUAL OWNERSHIP

State	Acre White Pine in Control Area	Acreage in Forest	Control Initially Worked	Control Re-worked	Per Cent Complete	Acreage On Maintenance
Virginia	36,296	73,240	71,405	2,350	97	58,463

In the above table it may be noted that there is apparently a reduction in the amount of white pine and control as compared to 1944 annual report. This is due to a change in the method used for determining acreage. Up through 1944 we included as Federally owned a large amount of privately owned holdings which were intermingled or adjacent to Federal lands and which for the most part were so near that it was necessary to cover them in order to protect the Federal pine. During 1945 a reclassification was made of all acreage resurveyed to date and it is not determined to the ownership line regardless of the conditions immediately adjacent to it. This has been done to show the actual acreage worked by Land Ownership regardless of the Operating Agencies performing the work.

BLISTER RUST CONTROL WORK IN 1945

The following table shows the amount of resurvey work accomplished during the year by the men while employed on Forest Service Funds. This shows quite a reduction from last year. However, a large amount of survey work was paid for from other funds and a larger percentage of the Forest Service moneys were spent on ribes eradication.

TABLE IIWHITE PINE RESURVEY BY THE JEFFERSON NATIONAL FOREST - 1945

State	Acres of White Pine Mapped	Acres Control Mapped	Approximate Percent Resurvey Completed
Virginia	13,834	19,040	30

RIBES ERADICATION

During the year ribes eradication work was confined for the most part to the Holston Ranger District principally along the Grayson-Smyth County lines. A relatively small area was covered in the southwestern corner of Wythe County and nearby Grayson County. Some heavy concentrations of ribes were found in the vicinity of Comers Rock, which accounts for the large number of bushes pulled during the year. It is believed that for the most part eradication work is quite thorough. After finding infected pine in this section of the State the eradication crews showed considerably more interest in the quality and quantity of their eradication work performed. The following two tables summarize ribes eradication work performed by men while being paid from National Forest Funds and also the acreage covered on Federally owned lands. The areas are worked using a square mile, or the necessary part thereof, as the work unit. A record was made of the ribes destroyed and the man-days used on each unit but no such breakdown was made on the land ownerships within that unit. For the most part the same men are used on Federal lands and private holdings. Every effort is made to charge the work to Federal Funds when they are working on Federal lands and in like manner they are paid from Cooperative Funds when working on private lands. Because of the irregular manner in which these holdings are intermingled it is impossible to confine crew work within ownership boundaries. Hence, there will always be a difference between acreages worked by operating agencies and that worked by land ownership.

TABLE III

SUMMARY OF RIBES ERADICATION BY FOREST SERVICE
ON THE JEFFERSON NATIONAL FOREST - 1945
(1)

State	Acres	Ribes Bearing Acreage Worked			Ribes	Man-	Approx. Acreage
	Covered	Initial	Rework	Total	Destroy-	Days	Ribes-Bearing
	Ribes				ed	Used	To Be Worked
	Free						(2)
Virginia	-	472	4,254	4,726	20,878	1,613	1,800

(1) All work by Forest Service Crews (includes some intermingled lands)

(2) Based on the present status of the survey.

TABLE IV

ACREAGE WORKED ON JEFFERSON NATIONAL FOREST - 1945

State	Acres Covered Ribes Free	Ribes Bearing Acreage Worked		
		Initial	Rework	Total
Virginia	1,660	445	4,115	6,220

During the beginning of the calendar year both the quality and quantity of labor available left much to be desired. We were cooperating with the War Manpower Commission and County Agent's offices in an attempt to avoid using men whose services were required on farms or war industries. Little effort was required to avoid competition in the latter case since our chief competitor was the Radford Ordinance Works. Their lowest wage rate per hour was approximately the same as the highest rate which we paid our most highly skilled men. The situation again improved after V-E Day and since V-J Day we have had more applicants than could be employed.

CHECKING

All of the areas were checked and for the most part found satisfactory. In a few cases where the work was not of acceptable standards the areas were reworked.

COSTS

The average cost per acre on ribes eradication in 1945 was \$1.95. This average cost per acre includes initial work and rework. Because of the nature of the original work performed in 1936 to 1938 it is next to impossible to delimit the new work areas from the old. Hence, some of the work reported as rework was actually initial. The average cost per acre on survey dropped from \$.10 in 1944 to \$.09 in 1945. Increase in wage rates and the granting of annual leave increased our per acre costs on ribes eradication somewhat in 1945. The following table gives a resume of the expenditures:

TABLE V

SUMMARY OF EXPENDITURES BY JEFFERSON NATIONAL FOREST - 1945

:	:	:	:	:	:	:
State	Labor	Supervision and Operation	Total	Cost Per Acre *	Eradication	Survey
:	:	:	:	:	:	:
Virginia	\$11,253.37	\$2,333.99	\$13,587.36	\$1.95	\$0.09	:
:	:	:	:	:	:	:

* Per Acre figures include labor and operational costs.

WORK SCHEDULE FOR 1946

During 1946 we hope to complete the survey on that part of the Holston and Wythe Ranger Districts which formerly made up the old Unaka National Forest. With favorable weather during the fall of the year we may possibly complete the survey on the remainder of the Wythe Ranger District. An attempt will be made to complete the eradication in the Holston and South Wythe Districts. Probably very little ribes eradication work will be required in the northern part of Wythe County. Since no survey has been made in Bland and Pulaski Counties, no estimate can be made of the needs for ribes eradication. It is known, however, that wild ribes are abundant in some sections of Bland County. They are believed relatively scarce, however, in Pulaski County. By the end of 1946 it is hoped that the survey will be complete or nearly so, for the entire forest except the New Castle Ranger District. At our present rate of coverage this can perhaps be completed in 1947. It is not likely that all eradication work will be completed by this time but for the most part eradication should follow fairly close behind the survey. The presence of the rust in the Wythe and

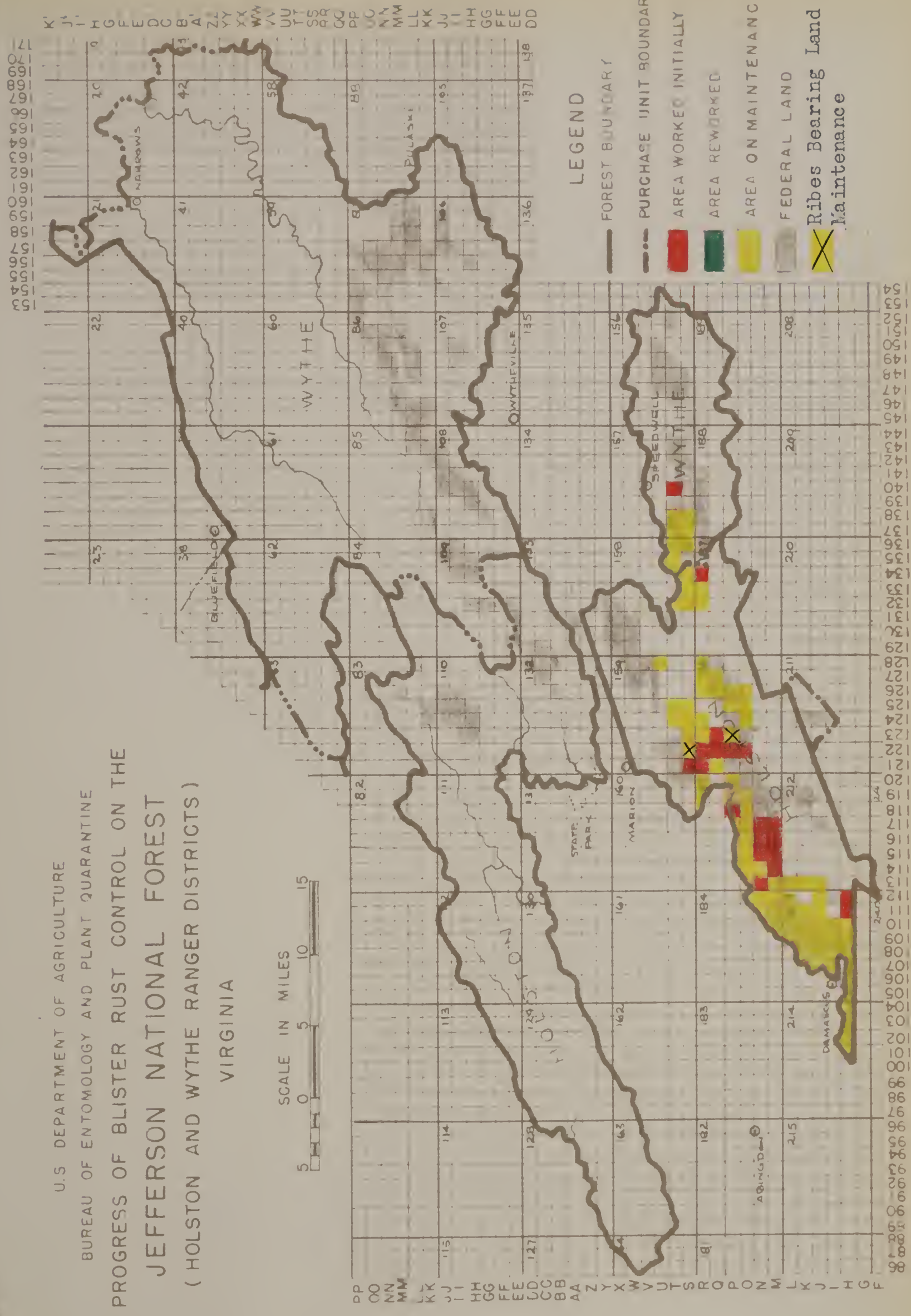
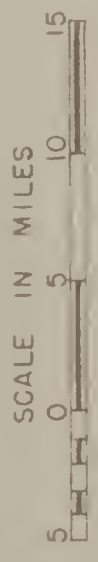
111.

Holston Districts will make necessary almost a continual process of post checking and eradication on a reduced scale for some years to come. No information is available regarding land acquisition but in the event an acquisition program is inaugurated by the Forest Service, some additional new work may be required as such acquisition progresses.

Following are two maps showing the general progress of blister rust control on the Holston, Wythe, Newcastle and Glenwood Districts.

FIGURE 7

U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
JEFFERSON NATIONAL FOREST
(HOLSTON AND WYTHE RANGER DISTRICTS)
VIRGINIA



LEGEND

- FOREST BOUNDARY
- - - PURCHASE UNIT BOUNDARY
- AREA WORKED INITIALLY
- AREA REWORKED
- AREA ON MAINTENANCE
- FEDERAL LAND
- ✕ Ribes Bearing Land on Maintenance

LEGEND

FOREST BOUNDARY

PURCHASE UNIT BOUNDARY

AREA WORKED INITIALLY

AREA REWORKED

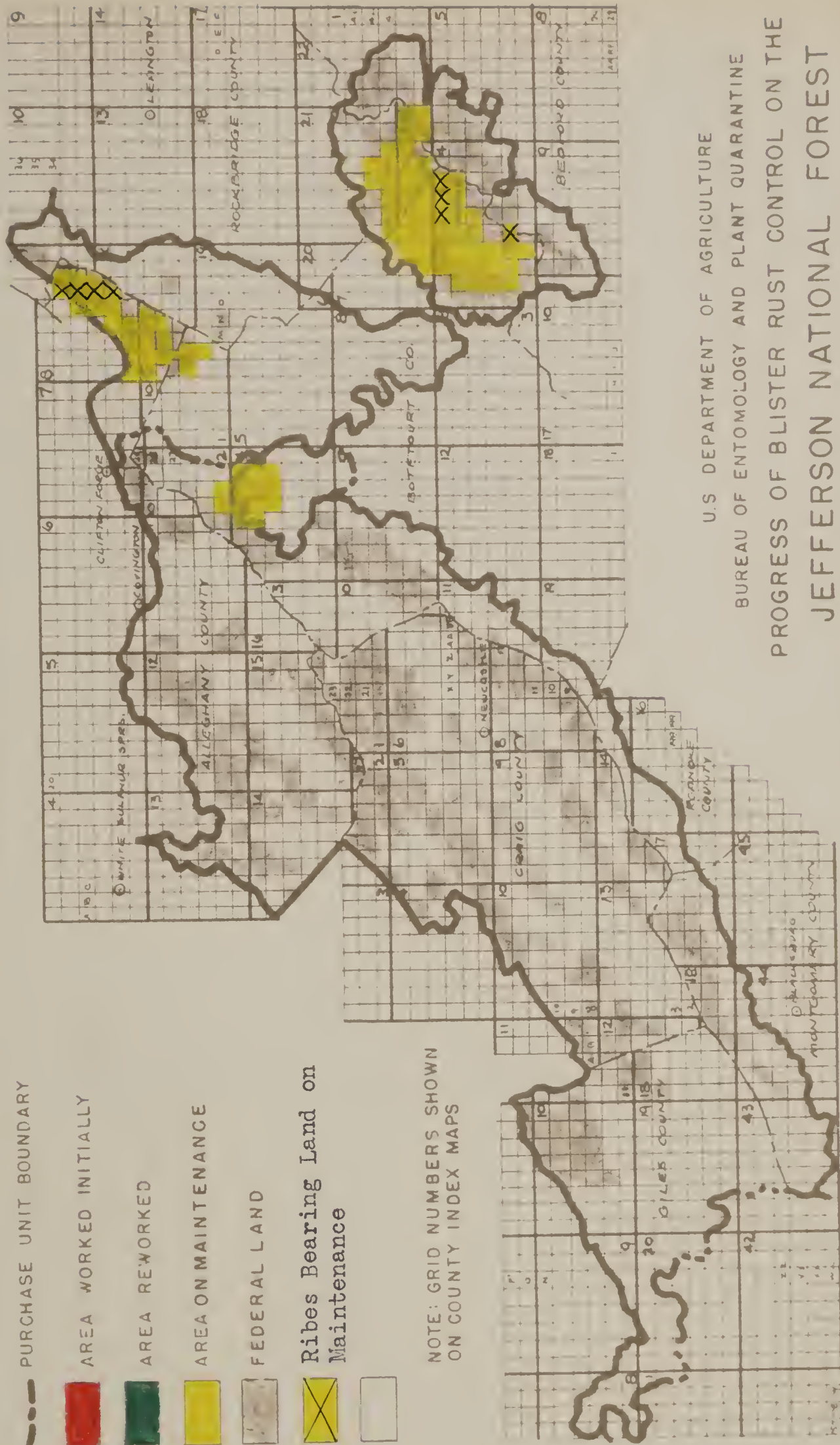
AREA ON MAINTENANCE

FEDERAL LAND

Ribes Bearing Land on Maintenance

NOTE: GRID NUMBERS SHOWN ON COUNTY INDEX MAPS

SCALE IN MILES
5 0 5 10 15



U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
JEFFERSON NATIONAL FOREST
(NEWCASTLE AND GLENWOOD RANGER DISTRICTS)
VIRGINIA

WHITE PINE BLISTER RUST CONTROL
IN THE
MONONGAHELA NATIONAL FOREST
WEST VIRGINIA
1945

By

Ralph W. Welch, Area Leader, Area No. 2

STATUS OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31, 1945

As of the end of 1945, approximately 90 percent of the second working program has been completed on the Monongahela National Forest. The only remaining work to be done lies in the southern extremity of the Forest, in Greenbrier County, on Little Creek, Anthony Creek, Whites Draft, Whitman's Draft, Humphrey's Draft and Fleming Run. The survey of that area, in the White Sulphur Spring Ranger District, should be completed in the spring of 1946 and it is probable that the ribes eradication program will be completed by mid summer.

The control program was begun on the Monongahela National Forest in 1936, and by the end of 1938, the initial work had been completed in Greenbrier and Pocahontas Counties, where the majority of the white pine on the forest is to be found. The first survey and the subsequent ribes eradication program gave protection to 27,865 acres of white pine, and the control area (white pine plus 900 foot protective zone) amounted to 77,062 acres. A total of 382,900 ribes were destroyed in the initial working over 14,549 acres of ribes bearing land. It is of considerable interest and significance to note that the white pine acreage figures, as determined by a resurvey conducted in conjunction with the second working, now stands at 40,802 acres, or an increase of 12,937 acres (32%) between the two workings of 1936-1938 and 1943-1945. Since a small amount of resurvey remains to be completed, it is probable that the final figure will be in the neighborhood of 45,000 acres of white pine.

It is pointed out that this acreage includes only a very small percentage of pure white pine, but represents, for the most part acreage upon which white pine is found growing in mixture with hardwoods. The percentage of the mixture varies greatly in different sections of the forest, as well as the number of trees per acre. A majority of the 40,802 acres, however, supports enough white pine growth to merit the application of blister rust control measures, especially so since ribes growth, generally speaking, is not so dense as to involve exceptionally high eradication costs.

In view of the general increase of white pine which is undoubtedly occurring within the Monongahela National Forest, it can be said that, with continued control over damage from indiscriminate cutting practices, fires, insects and disease, prospects are bright for a good growth of this species within the next several years in those sections of the Forest in which white pine is native. Growth of the species, however, is confined to a comparatively narrow range and is only found in abundance along the east drainage of the Greenbrier River in Pocahontas and Greenbrier Counties. The white pine belt extends in a strip approximately 50 miles in length from north to south and ten miles in width from east to west. In addition, smaller areas of white pine are found in Tucker County.

Probably as much as 90 percent of the total white pine acreage within the entire forest is to be found on the White Sulphur Ranger District, and the remainder on the Greenbrier and Cheat Ranger Districts. There is some evidence of white pine growth on the Potomac Ranger District, particularly along the North Fork of the Potomac watershed, but thus far blister rust control operations and white pine appraisals have not been conducted in that section.

TABLE I

STATUS AS OF DECEMBER 31, 1945

White Pine In Control Area	Control Acreage In Forest	Control Acreage Initially Worked	Control Acreage Re- worked	Percent Initial Work Completed	Acreage On Maintenance
40,802	82,577	82,577	9,650	100	77,180

(1) Approximately 20% of this acreage is ribes bearing and 80% ribes free.

(2) Includes ribes bearing acreage only.

BLISTER RUST CONTROL WORK IN 1945

Survey work, preliminary to ribes eradication, was performed principally in Greenbrier County, although some amount of survey was conducted on the Cheat Ranger District in Tucker County. In the latter area, only a small amount of work had been performed in the immediate vicinity of the Horseshoe Run recreational development. As a result of the 1945 survey, 3,644 acres of white pine were located and mapped in Tucker County on federal land and closely intermingled private land. The white pine areas mapped are located on tributaries of Horseshoe Run and Cheat River, such as Hyle, Maxwell, Mike, Drift, Dry, Mill and Clover Runs. Survey crews also mapped the 90 acre white pine plantation which was established on Clover Run some thirteen years ago and systematically examined the environs for the presence of ribes bushes. No wild ribes were found within 900 feet of the plantation.

The table below recapitulates the results of the survey work conducted during the current year under the Forest Service program on Forest Service and intermingled private land.

TABLE II

WHITE PINE AND CONTROL AREA SURVEYED IN 1945

Type of Survey:	Acres White Pine Surveyed	Acres of Control Area Mapped	Approximate percentage of Survey Completed
First	3,734	7,894	98
Second	14,747	26,575	90
TOTAL	18,481	34,469	92

During the year, ribes were removed from 2,729 acres of ribes-bearing land within the control areas, and 100,375 ribes bushes were destroyed on this acreage. More than one-half of this acreage represented first working (Tucker County) and almost 90% of the number of ribes destroyed were on the areas worked for the first time.

The effectiveness of the ribes suppression program was demonstrated in a study which was made comparing first and second workings in Greenbrier County. This study, which was distributed as one of a series of technical papers in September, 1945, reveals that the number of ribes found on areas reworked in 1944-1945 were far lower than the number found and destroyed on the same acreage when initially worked in 1936-1937. The following paragraph is quoted from the paper:

"Substantial decreases in the number of ribes being found on second workings make it evident that the ribes suppression program is being successfully accomplished. Therefore, large blocks of white pine acreage which have had the benefit of first and second ribes eradication programs may now be placed on a maintenance basis requiring only a minimum of control work in the future. In Greenbrier County the average number of ribes per acre dropped from 20.5 on first working in 1936-1937 to 5.8 on second working in 1944-1945, and such decreases are not exceptional to this particular County.

TABLE III

SUMMARY OF RIBES ERADICATION IN 1945
(Includes work on Federal and Intermingled Private Lands)

	Initial	Control Acreage	Ribes	Man-	Percentages
Forest	Acreage	Worked	Destroyed	Days	of Work
District	Ribes	Initial	Rework	Total	Completed
	Free				
Cheat	4,015	1,500	-	5,515	87,610
White		(1)			260
Sulphur	-	-	1,229	1,229	12,765
					198
TOTALS	4,015	1,500	1,229	6,744	100,375
					458
					96

(1) Also, 8,880 acres blocked out as ribes-free by post check and/or resurvey, with 38 man-days labor.

In addition to protection of native and planted white pine on the Forest, the environs of the Forest Service Nursery at Parsons, West Virginia were again examined in 1945, and a total of 94 ribes were destroyed within the 1,500 foot protective zone surrounding the nursery, which involves 651 acres of control area. Although the production of white pine, as well as other species grown at this nursery was curtailed during the war years, it is anticipated that future demands for planting stock will result in resumption of normal production within the next few years. Therefore, it has been general policy to continue the ribes suppression program surrounding the nursery at two year intervals.

TABLE IV

SUMMARY OF EXPENDITURES ON MONONGAHELA NATIONAL FOREST - 1945

Labor	Supervision and Operation	Total	Cost Per Acre *
			Eradication : Survey
\$6,524.55	\$2,157.94	\$8,682.49	\$1.48 : \$0.08

WORK SCHEDULE FOR 1946

Before the end of 1946, all survey work considered necessary at the present time will have been completed on the Monongahela National Forest, and the ribes eradication program will have been effected on all areas needing work at this time. Large sections will be on a maintenance basis requiring no additional control measures within the next decade, although a few local sections should be examined to determine the necessity of applying additional control measures at periodic intervals of five to seven years. In order to bring to completion the remainder of the program, application is being made for a small allotment in the fiscal year 1947.

INFECTION CONDITIONS

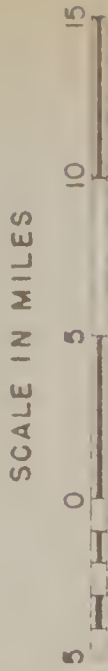
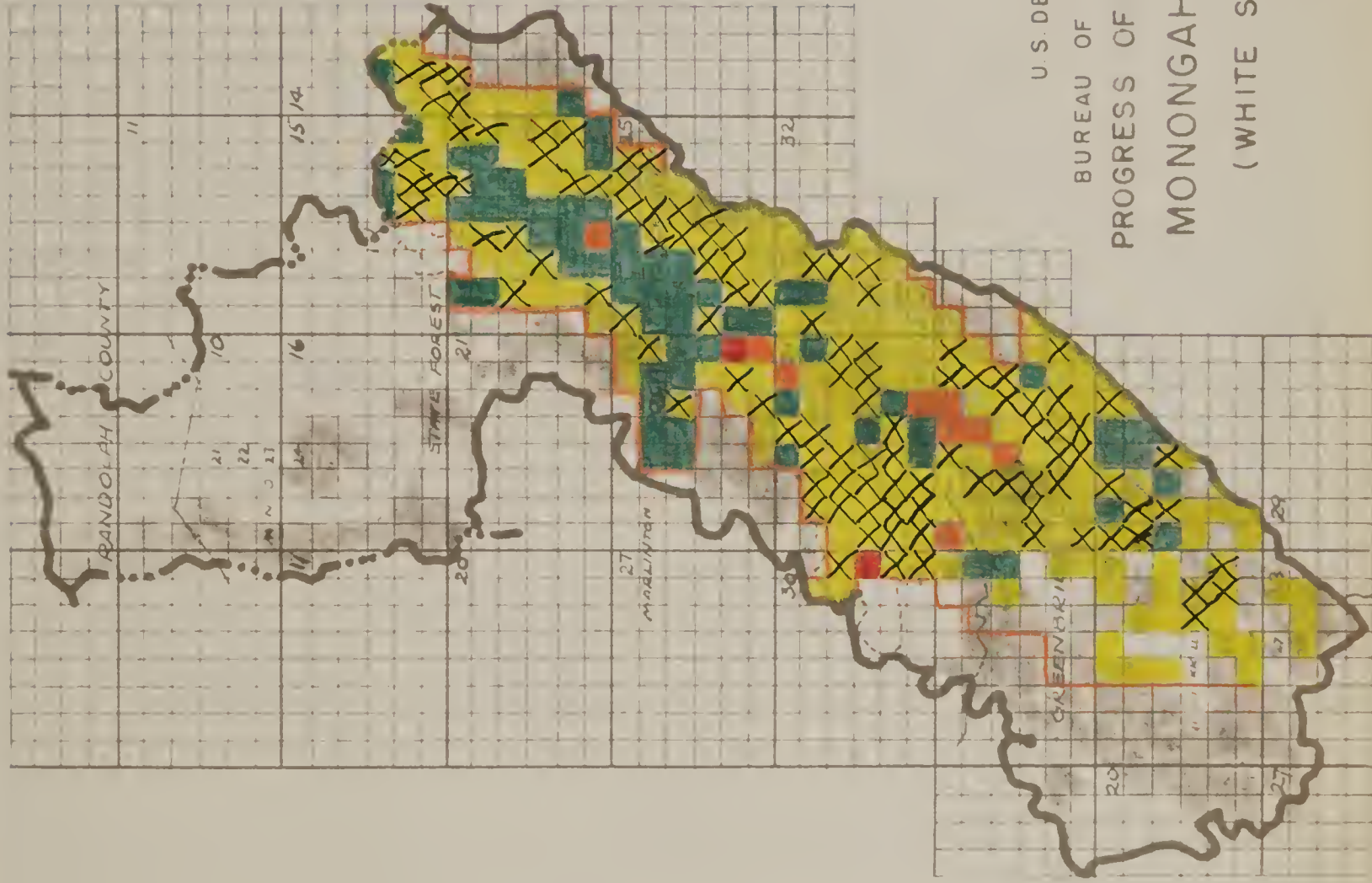
White pine infection is known to exist on all three Ranger Districts where white pine is of importance as a native species on the Forest. However, appreciable damage has not occurred except in a very few areas of restricted size in Tucker and Greenbrier Counties. In the latter county, 41 percent of a 19 acre stand of white pine on Spice Run was found to be infected in 1944. This area however, had not had the benefit of a ribes eradication program in previous years.

In general, it can be said that damage from blister rust has been held to a minimum on the Forest, and it is probable that much less than one percent of the total number of trees on the entire Forest has suffered from infection. In many cases, the trees which are now infected are "carry-overs" from years prior to the beginning of the eradication program.

LEGEND

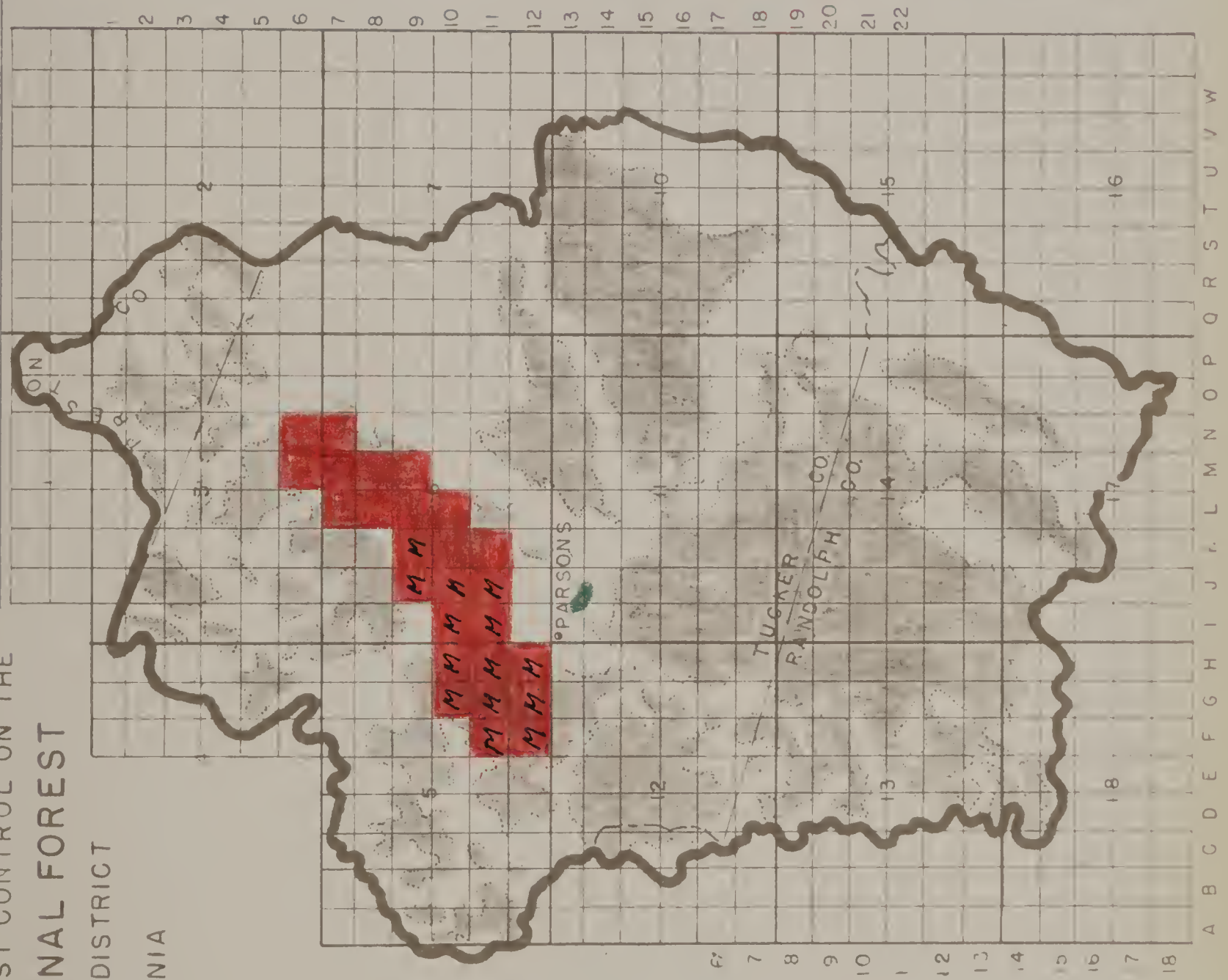
-  FOREST BOUNDARY
-  AREA WORKED INITIALLY
-  AREA REWORKED
-  AREA ON MAINTENANCE
-  FEDERAL LAND
-  Ribes bearing grids on maintenance
-  Area within control zone

NOTE: GRID NUMBERS SHOWN ON COUNTY INDEX MAPS.



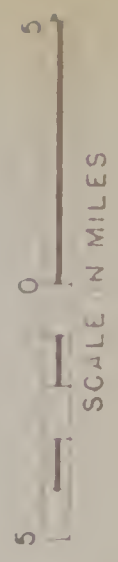
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
MONONGAHELA NATIONAL FOREST
(WHITE SULPHUR RANGER DISTRICT)
WEST VIRGINIA

U.S. DEPARTMENT OF AGRICULTURE
 BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
 PROGRESS OF BLISTER RUST CONTROL ON THE
 MONONGAHELA NATIONAL FOREST
 CHEAT RANGER DISTRICT
 WEST VIRGINIA

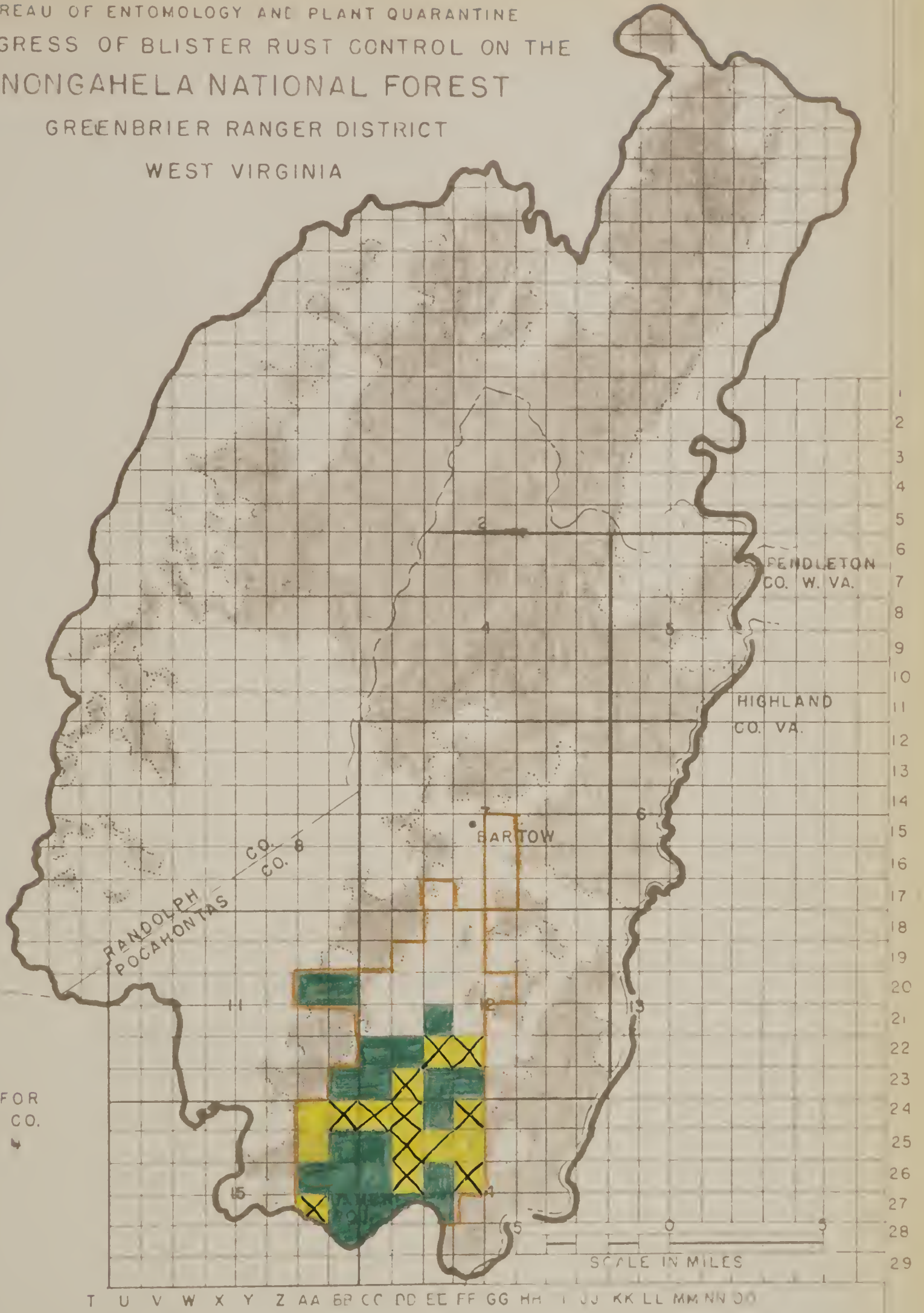


LEGEND

- FOREST BOUNDARY
- ▨ FEDERAL LAND
- ▨ F.S. NURSERY (PARSONS)
- AREA WORKED INITIALLY
- AREA REWORKED
- ▢ M AREA ON MAINTENANCE
- ▢
- ▢



U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
MONONGAHELA NATIONAL FOREST
GREENBRIER RANGER DISTRICT
WEST VIRGINIA



NOTE: GRID INDEX FOR
POCAHONTAS CO.
ONLY

LEGEND

- FOREST BOUNDARY
- ⋯ FEDERAL LAND
- ⋯ AREA WORKED INITIALLY
- AREA REWORKED
- AREA ON MAINTENANCE
- ⊗ Ribes bearing grids on maintenance
- Area within control zone

WHITE PINE BLISTER RUST CONTROL
IN THE
CHATTAHOOCHEE NATIONAL FOREST
1945

BLISTER RUST CONTROL AREA NO. 2

Ralph W. Welch - Area Leader
W. V. Zimmer - Assistant Area Leader

STATUS OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31, 1945

Practically all of the best white pine stands in northern Georgia are found within the purchase unit boundary of the Chattahoochee National Forest, and many of the better stands are under direct ownership of the Forest Service. Since 1934 white pine blister rust control work has been performed on National Forest lands within the Forest under various emergency, Bureau and Forest Service programs.

During the emergency programs large acreages were covered by general reconnaissance and wild ribes were eradicated more or less where they were found by the eradication crews. No detailed maps were made during this early period and it was soon found that adequate maps were needed in order to show the extent and density of white pine as well as to more clearly tie in the association of ribes and white pine.

In 1938 a detailed mile square grid survey was started and as the survey progressed it was soon found that many of the old eradication areas would need no further attention mainly because of the distance involved between white pine and ribes-bearing areas.

In general, white pine grows best in northern Georgia between 1,500 and 2,500 feet in elevation. Wild ribes are usually found either near the upper elevation limits of white pine or far above the present limits. However, during the past few years, under adequate fire protection, it has been noticed that white pine reproduction is gradually becoming established at higher elevations and in a matter of years some of the ribes areas worked a few years back should be re-examined to determine whether there is sufficient nearby white pine to warrant the extension of the control zone to higher elevations. So far the grid survey has been completed on the Toccoa Ranger District, the Blue Ridge Ranger District, and only a small portion of the Tallulah Ranger District remains to be finished. It is expected that this also will be completed in 1946. When this district is completed the entire Chattahoochee National Forest will be on maintenance.

TABLE I

STATUS OF CONTROL WORK AS OF DECEMBER 31, 1945

:	:	:	:	:	:	:	:	Percent :
:Acreage:	Acres of :	First :	Other :	Acreage:	Total :	Total:	Initial :	:
: Grid :	White Pine:	Working:	Workings:	on Main:	Ribes :	Man-	Work Com-:	:
:Mapped :	Mapped :	Acres :	Acres :	tenance:	Destroyed:	Days :	pleted :	:
: (1) :	(2) :	:	:	:	(3) :	:	:	:
:347,259:	239,621 :	347,259:	145 :	347,259:	1,332,473:	9,958:	99.1% :	:
:	:	:	:	:	:	:	:	:

- (1) It is estimated that 12,000 acres of control area remains to be mapped, in addition to the above.
- (2) It is estimated that 10,000 acres of white pine remains to be mapped, in addition to the above.
- (3) On federal land and intermingled private land.

BLISTER RUST CONTROL WORK IN 1945

White Pine Survey

White pine surveys were continued during the calendar year of 1945. The crews worked out of camp located at Lake Winifield Scott in Union County until mid-February. At that time, work had been completed in this territory and camp was moved to Unicoi Gap, also in Union County. Camp was maintained there for the remainder of the year. Buildings at both of these camp sites were furnished through the cooperation of the U. S. Forest Service.

By grid survey 99,330 acres were mapped representing an increase of 55,670 acres over the 1944 coverage. It was possible to place the entire acreage covered, 99,330, on maintenance as only two small patches of ribes were found during the year, both on which were out of the protective zone and did not warrant eradication. Of the 99,330 acres surveyed, there were 79,448 acres of pine, 14,511 acres of which averaged 50 or more stems per acre and 64,937 acres less than 50 stems per acre.

TABLE II

WHITE PINE AND CONTROL AREA SURVEYED IN 1945

: Acres White Pine Mapped				: Acres :
: 50 or More:	: Under 50 :			: Control:
: Stems :	: Stems :	: Total :		: Area :
: Per Acre :	: Per Acre :			: Mapped :
: 14,511 :	: 64,937 :	: 79,448 :		: 99,330:
:	:	:		:

Ribes Eradication Work in 1945

Our survey determined that only two grids in Towns County contained small areas of wild ribes located on Federal land in the Chattahoochee National Forest. In Block #20-A, grid D" 23, eighty four bushes with 674 estimated feet of live stem were found in the vicinity of Henson Gap, this ribes area being approximately 2-1/2 acres in extent. In Block #19, grid C-12, twenty eight bushes with 360 estimated feet of live stem were located in the vicinity of Tray Mountain with approximately 1 acre ribes bearing. (See Attached Map). These areas will need no eradication at the present time and will present no problem unless pine reproduces within the protective zone, at some future date. The areas are being added to others for future checking and consideration.

Control work of one type or another has been conducted in the following counties during 1945: Rabun, White, Towns, Habersham, Lumpkin and Union.

Labor and Supervision

Work was carried on under direct supervision of Assistant Area Leader, W. V. Zimmer and Field Supervisor, Fred W. Hall, with Miss Margaret L. Simmons acting as Clerk-stenographer in the Dahlenega office. The size of the crew varied from eight to ten men.

The labor situation has improved during the year, and we were able to secure our quota of men. However, we were still unable to secure a sufficient number of employees in all required sections and base camps continued to operate as the most logical way of working areas where sufficient local labor was not available. The turnover of labor was small due to the camp operation which enabled us to keep well-trained crews in the field. As in the past, we have continued to grant leave of absence seasonally to men for agricultural purposes.

TABLE III

COST OF BLISTER RUST CONTROL PROGRAM ON NATIONAL FOREST, 1945

:	:	:	:
Labor	Supervision	Total	:
:	and Operation	:	:
:	:	:	:
\$6,618.12	\$3,918.39	\$10,536.51	:
:	:	:	:

WHITE PINE

As of the end of 1945, we have mapped a total control acreage of 347,259 acres in the Chattahoochee National Forest, included in which are 289,621 acres of white pine. The entire control acreage has been put on a maintenance basis. Most of the white pine mapped is young growth with 75 to 80 percent being four inches or less in diameter. The distribution is quite wide and general with stockings varying from 50 stems per acre to well over a thousand per acre. Under fire protection white pine is doing exceptionally well in north Georgia, and reproduction is rapidly spreading in many sections, increasing the acreage greatly.

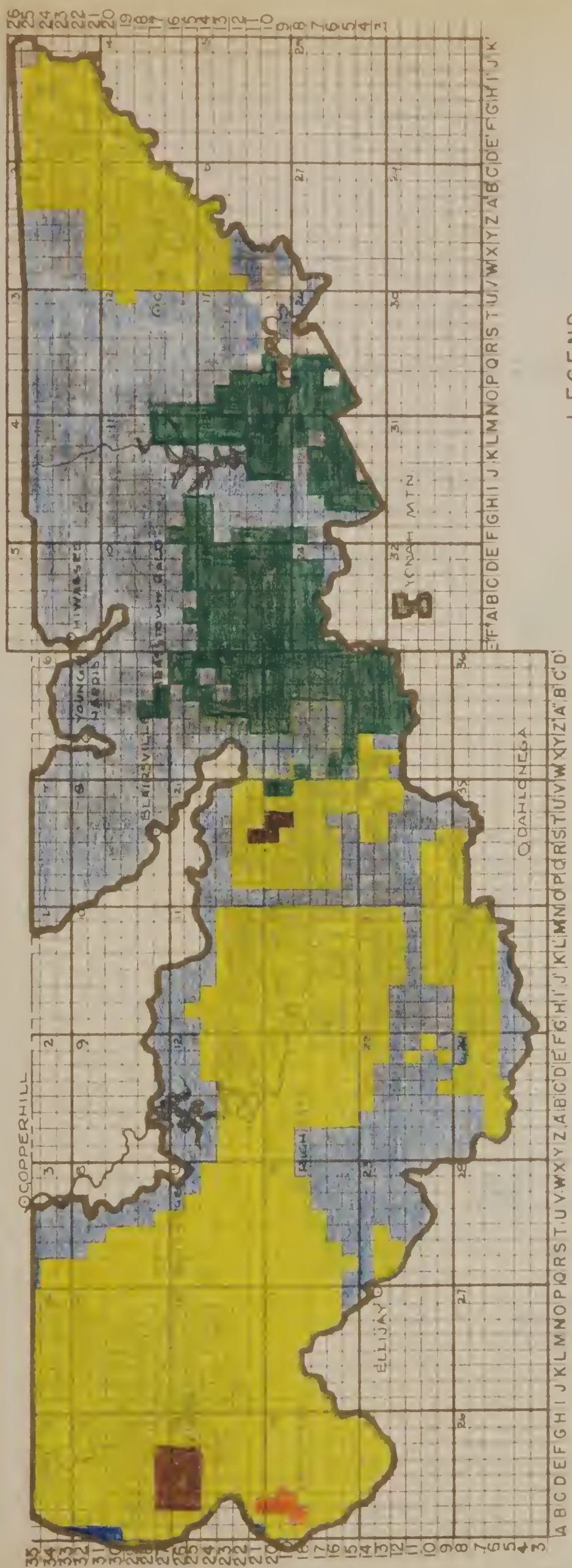
RECOMMENDATIONS FOR FUTURE WORK

At the end of 1945 the blister rust control program on the Chattahoochee National Forest is approximately 99 percent completed and placed on maintenance, with only a few thousand acres remaining to be examined. Before the end of 1946, it is planned to examine the remaining acreage, thus completing the survey within the Forest. In future years, periodic checks will be conducted from time to time in the general vicinity of the

known ribes areas to determine any change in the status of white pine growth in the proximity of these areas so that control of the disease may be adequately maintained. At the same time, examinations will be conducted to determine if the disease has made entrance. Thus far blister rust infections are unknown in Georgia, either on the ribes or white pine host.

The Forest Supervisor and the various Rangers will be contacted as the need arises and any further recommendations will be made known through them. For the most part, however, the future problem of blister rust control within the Chattahoochee National Forest reverts to occasional inspections of areas where some danger might exist if the disease makes its appearance and if white pine reproduction spreads to within infection range of the areas. Within the next few years, a general check may be conducted to determine the status of cultivated ribes within some of the better pine growing regions of the forest.

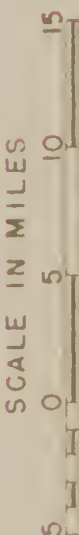
CHATTAHOOCHEE NATIONAL FOREST



LEGEND

- FOREST BOUNDARY
- Area Ribes-bearing
- AREA WORKED INITIALLY 1945
- AREA REWORKED 1945
- (All) AREA ON MAINTENANCE
- FEDERAL LAND
- Area Unworked
- Covered by Reconnaissance. Pine does not warrant grid survey.
- Area worked initially, prior 1945

U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
CHATTAHOOCHEE NATIONAL FOREST
GEORGIA



WHITE PINE BLISTER RUST CONTROL

IN THE

CUMBERLAND NATIONAL FOREST

KENTUCKY

1945

BLISTER RUST CONTROL AREA NO. 2

Ralph W. Welch - Area Leader
W. V. Zimmer - Assistant Area Leader

STATUS OF THE CONTROL WORK AS OF DECEMBER 31, 1945

Blister rust control work was first conducted in the Cumberland National Forest of Kentucky in 1934 when a survey of the white pine stands was conducted, and ribes eradication work performed where necessary. The principal stands were found in Wolfe, Powell, Menifee and Lee Counties, along the Red River and its tributary streams. The 1934 program was conducted over private, State and federal land ownerships, and no particular effort was made to segregate the acreage found by ownership classes. Wild ribes were found in only one locality - along Chimney Top Hollow in Wolfe County. This area is under Federal ownership. Cultivated ribes were found at several home sites and abandoned home sites within the purchase unit of the Forest.

In 1939, Mr. J. Curtis Ball of the Bureau of Entomology and Plant Quarantine, assisted by personnel of the Cumberland National Forest inspected several white pine plantations which had been established within the Forest, and also examined a few additional stands of native pine. Wild ribes were not observed during the course of the inspection work. As of the end of 1939, the best available figures indicated the presence of 14,401 acres of native white pine on the Forest, in addition to 77 acres of planted white pine. The total of pine plus the 900 foot protective strips amounted to 30,565 acres.

In April, 1945, Mr. G. E. Keaton conducted a reconnaissance of the white pine belt to determine the general status of white pine. Shortly thereafter, a systematic survey was begun to determine the status of white pine and the need for application of additional control measures. From the results of the survey conducted in 1945, it becomes apparent that white pine acreage within the Forest has increased considerably between the 1934 and 1945 surveys, since 12,928 acres of pine were surveyed on Federal land in 1945, and the survey is not more than 60 or 70 percent completed.

TABLE I

STATUS AS OF DECEMBER 31, 1945

: White Pine :	: Control :	: Control :	: Control :	: Total :	: Total :	: Percent :	: Acres :
: in :	: Acreage :	: Acreage :	: Acreage :	: Ribes :	: Man- :	: Initial :	: on :
: Control :	: in :	: Initially :	: Re- :	: Destroyed :	: Days :	: Work :	: Mainte- :
: Area :	: Forest :	: Worked :	: worked :	:	:	: Completed :	: nance :
:	:	:	:	:	:	:	:
: 14,478 :	: 30,565 :	: 30,565 :	: 65 :	: 4,690 :	: 847 :	: 100 :	: 30,565 :
:	:	:	:	:	:	:	:

BLISTER RUST CONTROL WORK IN 1945White Pine Survey

A recapitulation of white pine survey work conducted on lands actually owned by the Forest Service follows:

TABLE IISURVEY, CUMBERLAND NATIONAL FOREST, 1945

County	Federal Control Acreage Examined	Federal White Pine Acreage Mapped			Total White Pine Acreage	Man- Days Survey
		50 and Over trees per acre	Under 50 trees per acre			
Wolfe	11,241	3,543	4,316		7,859	—
Powell	5,916	530	1,361		1,891	—
Meniffee	6,352	713	2,400		3,178	—
TOTAL	23,509	4,786	8,142		12,928	101

It will be noted that 63 percent of the white pine examined falls in the general class averaging less than 50 trees per acre. In many cases, white pine densities are gradually building up through natural seeding and with the provision of adequate fire control in future years, it is expected that stems per acre will continue to increase, and that white pine will compete favorably with other forest species such as yellow pine and various species of hardwoods.

In some sections surveyed, white pine averaged as high as 520 stems per acre and completely dominated the forest stand. Such high density stands were particularly in evidence in Wolfe County within a radius of a few miles of Campton and Pine Ridge. One exceptionally fine stand was mapped on Swift Camp Creek, near Campton.

Ribes Eradication

Wild ribes were found only in the Chimney Top Hollow area, near Pine Ridge, in Wolfe County. When this area was originally worked in 1934 a total of 2,093 bushes were found and destroyed as compared with only 749 bushes found and destroyed in 1945. This reduction in number of bushes between first and second workings indicates the effectiveness of the initial eradication program, and is similar to reductions being noted throughout the Southern Appalachian Region.

TABLE III

SUMMARY OF RIBES ERADICATION ON CUMBERLAND NATIONAL FOREST
(All eradication work performed with Bureau funds)

Forest District	Initial Acreage	Control Acreage Worked			Ribes Destroyed	Man-Days Used
	Ribes Free	Initial	Rework	Total		
Red River	-	-	* 65	65	749	10

* In addition, approximately 20,000 acres of Federal control area was examined by post check and/or resurvey and was found to be free of ribes.

STATUS OF BLISTER RUST

Blister Rust infections have not yet been discovered on the Cumberland National Forest, nor in the State of Kentucky. However, infections have been found in virtually every adjoining State, and it is entirely possible that the disease might be present, although not yet detected. Since the control program has not been active in the State since 1934, except for occasional inspection tours in intervening years, no concerted effort has been made to locate infections. In 1946, it is planned to examine ribes, wherever found, to determine if the disease is present.

COSTS

The program was begun on April 9 with funds provided by the Forest Service. With the expiration of that appropriation on June 30, the program was continued by utilizing funds provided by the Bureau which were set aside for conducting work on intermingled Federal and private land.

TABLE IV

COST OF OPERATION - 1945

Agency	Cost of Labor	Cost of Supervision and Operation		Total Cost	Cost Per Acre	
					Eradication	Survey
Forest Service	718.28	128.32		846.60	-	-
Bureau Intermingled land	1,477.91	143.41		1,621.32	-	-
TOTAL	2,196.19	271.73		2,467.92	\$0.98	\$0.028

WORK SCHEDULE FOR 1945







As of the end of the year the resurvey program remains to be completed in Wolfe, Powell, Menifee and Lee Counties on Federal and intermingled private lands. The majority of the survey on Federal lands has been completed in these four counties, but a considerable amount of pine remains to be examined on intermingled private land. Plans are to complete the entire survey within the main white pine belt in the 1947 fiscal year.

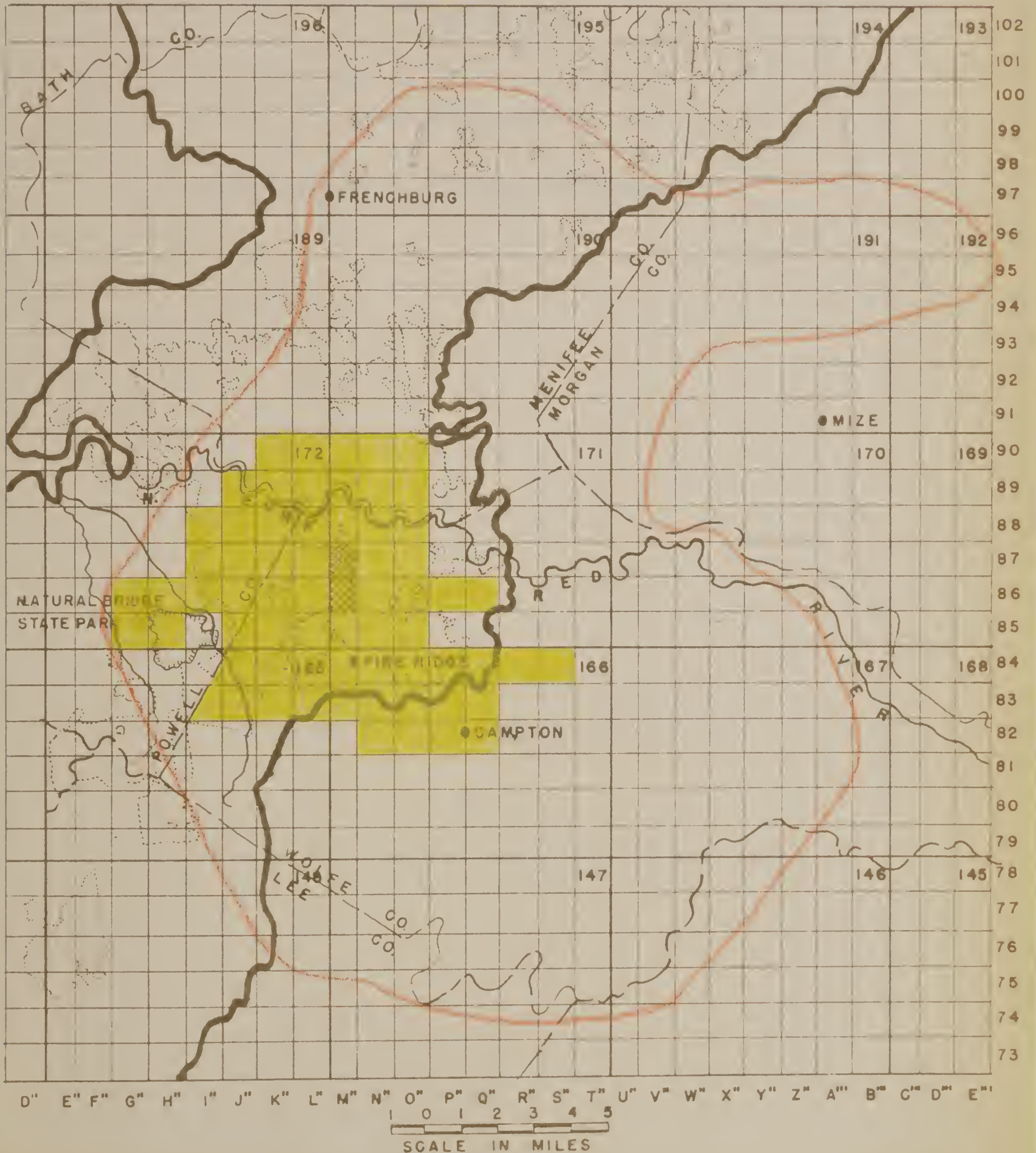
Although wild ribes have been found only in the one locality thus far, it is entirely possible that additional ribes bearing lands will be found by our survey and checking crews. However, it is anticipated that the entire survey-eradication program will be completed by the end of the 1947 fiscal year. Thereafter, it is doubtful if any additional control work will be necessary within the following ten year period.

PROGRESS OF BLISTER RUST CONTROL ON THE
CUMBERLAND NATIONAL FOREST-KENTUCKY
(SO. CENTRAL RED RIVER DISTRICT)

134.

LEGEND

- FOREST BOUNDARY -----  RIBES AREA (Worked 1934, 1945) 
- AREA WORKED INITIALLY -----  AREA REMAINING TO BE WORKED ----- 
- AREA REWORKED (On Maintenance)  FEDERAL LAND ----- 



PART VI

Work Project BLR-5

Detailed Reports on Blister Rust Control on
National Park Lands - 1945

By

Henry E. Yost, P-3, Area Leader, Area No. 1

H. B. Teague, P-2, Assistant Area Leader

And

W. L. Savage, Park Forester, Great Smoky National Park

WHITE PINE BLISTER RUST CONTROL WORK
IN THE
SHENANDOAH NATIONAL PARK
1945

BLISTER RUST CONTROL AREA NO. 1

Henry E. Yost -- Area Leader

STATUS OF CONTROL

The status of control on the Shenandoah National Park remains much the same as last year and is shown in the following table:

TABLE I

STATUS OF CONTROL

White Pine In Control Area	Control Acreage In The Park	Control Acreage Initially Worked	Control Acreage Re- worked	Per Cent Initial Work Completed	Acres On Maintenance
8,710	16,570	13,745	8,344	83	1,580

Since the first CCC work on blister rust control was started on the Park in 1933 a total of 2,618,239 ribes have been eradicated with an expenditure of 29,821 man-days. The work has been conducted by various Federal emergency and regular programs with the Park Service and the Bureau acting as operating agencies.

The original survey which was started under the CCC program was quite extensive and more control acreage was covered than was practicable to maintain. A reappraisal of the situation was made with the introduction of the mile square grid system of survey. As the grid survey progressed the white pine areas were appraised as to density of stocking, amount of infection present, recreational value, scenic value and other factors considered with respect to policies established by the Park Service. Of the 59 original white pine areas on the Park, all but 7 have been re-surveyed. Of the 52 areas resurveyed, 13 have been abandoned and two combined as one area. Although the square mile grid is the basic work unit, the original area system has been maintained. It is planned to complete the resurvey on the remaining seven areas in 1946.

An excellent set of permanent control record maps are being prepared by Mr. Moore, which show the status of control for each white pine area. These maps are built up from the 8" to the mile field grid maps and from field data sheets.

BLISTER RUST CONTROL WORK IN 1945

The control work during the year consisted entirely of resurvey and checking.

TABLE II

SUMMARY OF CONTROL WORK IN 1945

Acres of Pine Mapped	Control Acres Mapped	Man- Days
834	2,317	117

About three-fourths of the above pine was not found to have a sufficiently high value or was found in such heavy concentrations of ribes that it was not included in the control area. Likewise, about one-half of the control area mapped was discarded. In addition to the above, checking was conducted on 5,605 acres of control area. In general the ribes comeback within the control area is not great, but bushes are growing in sufficient quantities and a considerable amount of ribes eradication work will be necessary in future years. Survey and checking were carried on by C.P.S. (1) laborers under the supervision of Park Service checkers. Some of the survey was conducted by a crew from the Soil Conservation Service, C.P.S. camp located near the south end of the Park. These men worked under the direction of Mr. Elbert L. Dove, who was loaned by the Bureau to the Park Service for a few weeks. The remainder of the work was supervised by Mr. Roy C. Sullivan, until he was assigned as a ranger on the Park. Mr. Max Strickler, a veteran of World War II was then employed for a short while to take Mr. Sullivan's place.

All blister rust control on the Park is directly supervised by Park Forester, Robert B. Moore, who cooperates closely with the Bureau

COST OF BLISTER RUST CONTROL IN 1945

TABLE III

SUMMARY OF EXPENDITURES IN 1945

Labor	Supervision and Operation	Total
\$946.80	\$438.39	\$1,385.19

The above labor cost is based on 263 man-days of C.P.S. labor at an estimated value of \$3.60 per day. The cost per acre for survey in the Park, as well as for checking, compared favorably with other projects when all of the facts are considered. Some additional time was required for the training of Mr. Strickler. The turnover in the C.P.S. labor this year is probably greater than last year, which requires that a large amount of time be spent in the training of men. All of the survey and checking work on the Park is run on a 5% coverage, while most of it on other projects is based on 2.5% coverage. A higher percentage of coverage is justified on the Park because of the high recreational values involved.

WORK SCHEDULE FOR 1946

It is planned during the coming year to complete the resurvey of the before mentioned seven areas. A considerable amount of checking work will be continued and such eradication as is found necessary. At present, it appears that the C.P.S. camp will be transferred or disbanded not later than June 30. The budget estimates for the Fiscal Year of 1947 provide for employing local labor. Action has already been taken to fill the vacancy with a checker on the Park and it is hoped that survey work will be begun sometime during February, and a considerable amount of the work accomplished before the spring Fire Season. It is planned to continue employing a checker seven months of the year on blister rust control and five months a year on fire control, thus making it possible to continue with the same man year after year.

WHITE PINE BLISTER RUST CONTROL WORK

IN THE

BLUE RIDGE PARKWAY

1945

BLISTER RUST CONTROL AREA NO. 1

Henry E. Yost - Area Leader

H. B. Teague - Assistant Area Leader

STATUS OF CONTROL

The status of blister rust control on the Parkway appears to be much the same as last year.

TABLE I

STATUS OF BLISTER RUST CONTROL - 1945

State	White Pine In Control Area (Acres)	*	Control Acreage Initially Worked	Control Acreage Re- worked	Per Cent Initial Work Completed	Acres On Mainten- ance**
Virginia	630	2,581	2,581	-	100	1,544
North Carolina	1,779	4,388	4,388	-	100	4,378
TOTAL	2,409	6,969	6,969	-	100	5,922

* This represents only that part of the total control area which is surveyed. For the entire Parkway, including those parts not yet graded, probably some 65% of the survey is completed. Of the total control acreage worked, 1,047 acres are ribes-bearing and 5,922 acres ribes-free.

** Outside the established control areas on the Parkway.

There were 16,838 ribes pulled and 458 man-days spent by the Park Service and other agencies. The blister rust is obviously developing rapidly over much of that part of the Parkway north of Buena Vista. The rust was found on pine for the first time this year, on Section 1-E, Stations 212 to 214, left, which is in the vicinity of Montebello, Virginia. So far the infection is of little consequence since the infected trees are a part of a scattered stand, severely suppressed by hardwoods and are not considered worth protecting. This is near an older infection which was reported two years ago in the same general vicinity, and which is a short distance east of the Parkway line.

CONTROL WORK IN 1945

No ribes eradication work as such was carried on during the year. Late in 1944 a stand of white pine was reported on the east slope of Sharp Top, which is in the Peaks of Otter area. The survey covering the

northern part of the Peaks of Otter subsequently extended to include this pine and the surrounding control zone.

TABLE II

SUMMARY OF WHITE PINE SURVEY - 1945

State	Acres of White Pine Mapped			Acres In
	50 or More	Under 50		Control
	Stems	Stems	Total	Area
	Per Acre	Per Acre		Mapped
Virginia	48	150	198	775

The work was performed by C.P.S. (Civilian Public Service) labor from a camp at Bedford and was done under the direction of Mr. Gordan Simmons, who was loaned to the Parkway by the Bureau. This surveyed area was not included in the control area of the Parkway, but was placed on the same status as most of the remainder of the Peaks of Otter. Varying amounts of pine were found scattered between the high elevation points in this area. Ribes are present over a large part of the area, and in many cases were found in heavy concentrations. The pine on this area is, at present, not considered worth protecting. The final decision, however, will not be made until development plans for the Peaks of Otter area are completed.

A work plan was prepared providing for eradication of cultivated ribes between Adney Gap and the North Carolina-Virginia line. The Bureau was to find and recommend a qualified man to do this work. Due to the labor shortage, no qualified man could be found and, therefore, no work was accomplished.

COSTS

TABLE III

COST OF BLISTER RUST CONTROL - 1945

State	Agency and Program	Labor
		and Supervision
Virginia	Park Service C.P.S.	\$ 60.00
	Bureau	57.16
TOTAL		\$117.16

The first item of costs listed in Table III represents 20 C.F.S. labor man-days at \$3.60 per eight-hour man-day. The second item represents a reimbursement of the Bureau for the services of Mr. Simmons.

There is no appreciable change in the white pine and ribes occurrence as shown in the last year's report and its accompanying map.

WORK SCHEDULE FOR 1946

During 1946 it is planned to make a survey of the white pine and ribes at Cumberland Knob and Bluff Park. Arrangements are being made to assist the Park Service in securing experienced mappers, who have previously worked for the Bureau in this general vicinity. It is planned to make the survey in the early spring so the pine and ribes data can be secured simultaneously.

Tentative plans have been made by the Parkway Superintendent to assign Ranger Dillon to check on the previous eradication of cultivated ribes from the North Carolina-Virginia line as far north toward Adney Gap as the season will permit. This work will be done during the early spring when the leaves first appear on ribes bushes. Frequently bushes or sprouts from former bushes will grow at abandoned home sites and are so covered over with other vegetation that it is practically impossible to locate them at any other season of the year. It is fortunate that Mr. Dillon can be assigned to this work. The job requires that the checker have special qualifications and he appears capable and interested.

As conditions now stand, 1946 should mark the completion of the survey along those sections of the Parkway which have been graded or completed. In all probability the ungraded portion of the Parkway, in the vicinity of the James River, will not present any serious problem. Little is known regarding the ungraded sections from the end of construction north of Highway No. 460 south to Adney Gap. It is entirely possible that white pine and ribes may both be found in this section. If, and when, the Parkway is relocated between Grandfather Mountain and Blowing Rock, it is very likely that ribes will be found along much of the right-of-way. Some pine is believed to be present in this vicinity and a survey may be necessary. For that section of the Parkway south of Little Switzerland some survey work will be required as the grading is completed. Present information indicates that the necessary work will not represent any great problem.

WHITE PINE BLISTER RUST CONTROL WORK
IN THE
GREAT SMOKY MOUNTAINS NATIONAL PARK
1945

BLISTER RUST CONTROL AREA NO. 1

Henry E. Yost - Area Leader
H. B. Teague - Assistant Area Leader

And

W. L. Savage, Park Forester

STATUS OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31 1945

The following table shows the status of control in the Great Smoky Mountains National Park. It is essentially the same as last year. While some survey and resurvey work was carried on during the year, not enough of the area was included in the over-all control zone to have any appreciable change in the acreage figures.

TABLE I

STATUS OF RIBES ERADICATION - 1945

State	White Pine In Control Area	Control: Acreage: In Park	Control: Acreage: Initially: Worked	Control: Acreage: Re- worked	Per Cent: Initial Work Completed	Acres On Maintenance and Ribes Free
North Carolina	9,975	22,727	22,727	461	100	22,200
Tennessee	45,522	76,708	76,708	-	100	76,708
TOTAL	55,497	99,435	99,435	461	100	98,908

There were 105,466 ribes pulled and 2,648 man-days spent on the Park by several agencies.

Probably one of the most important developments during the year affecting the status of the blister rust control program in the Park was the finding of blister rust approximately 100 miles further south in the region than has heretofore been reported. The most southerly known infection on white pine is located in Ashe County, North Carolina and is some 90 miles air line from the northeastern edge of the Park. The southward movement of the rust during the past 10 years may be regarded as a definite indication that the rust may be expected to move as far south as white pine and ribes are growing in association with each other. There are many situations, both within the Park and outside, where rust could, and probably will, become established. There are numerous high mountains on which ribes are very abundant at the higher elevations and on which are found occasional individual or scattered stands of white pine. It is not economical or practical to protect such pines in most cases. It is important, however, that all facts regarding the pine and ribes distribution in the Park be ascertained. This can be satisfactorily accomplished only by survey.

The survey is complete for the Cataloochee and Deep Creek watersheds in the North Carolina Division. Some white pines are known to be present in the North Carolina Division, south of Deep Creek, and comparatively little information is available concerning the white pine stands on that land which is expected to become a part of the Park in the vicinity of Fontanna Lake. A survey at twenty chain intervals on the Tennessee side was completed in 1942. No wild ribes were found growing in close association with the better stands of white pine, however, a few cases are known where scattered white pines are growing with wild ribes, and there is reason to believe that there may be cultivated bushes at some abandoned home sites. There is ample evidence to indicate that, in some instances, white pine has become established at elevations of about 5,000 feet or more.

Should the blister rust become established in the Park and kill much of the scattered white pine at the high elevations, that in itself, would not represent any great loss to the Park. Should such conditions exist, however, it would greatly increase the chances of abandoned cultivated bushes or isolated pockets of wild ribes at low elevations becoming infected each year. Such bushes could do considerable damage to the excellent white pine stands at these lower elevations. In order to insure the maximum degree of protection, a careful check should be made for such abandoned bushes and isolated pockets. It should be determined definitely just what pine is regarded as worth protecting and the necessary ribes eradication work continued.

For the most part, these requirements have been met with respect to the better stands of white pine and the more widely distributed wild ribes bearing areas near the better pine but a considerable amount of resurvey work will be necessary and thereafter, a relatively small amount of ribes eradication work each year. There is little hope of keeping the rust out of the Park, but on the other hand, there is no reason why, with a moderate amount of control work, there should be any appreciable loss because of the disease.

BLISTER RUST CONTROL WORK IN 1945

During the year practically all of the work was spent on white pine resurveys. A resurvey was made on a part of Mount Sterling Ridge where one small stand of white pine was missed in the original survey. The survey on Deep Creek, which was begun in 1944, was completed during the year. A survey was begun on Little River, Tennessee, for the purpose of learning whether any appreciable changes had occurred since the time of the original survey. It was found in the case of Mount Sterling that a 2.5 percent survey under certain conditions is inadequate. Most of the Tennessee survey was made on this basis, or less. It is planned to resume this work on Little River as a check on the former survey. During the month of August several areas were scouted for the occurrence of blister rust on ribes bushes. Over 100 bushes were examined carefully on Mount Sterling, Clingaman's Dome and Forney River, but no evidence of the rust was found.

At the same time Gregory's Bald was scouted. No ribes were found there. However, several white pine seedlings, originating about 1939, or 1940, also two white pine trees, estimated 10 to 15 years old, were observed. This, as well as other observations, indicate that the pine is invading the higher elevations.

TABLE II

SUMMARY OF WHITE PINE SURVEY - 1945

State	Acres White Pine Mapped			Total Acres Examined and Mapped
	50 or More	Under 50	Total	
	Stems	Stems		
	Per Acre	Per Acre		
North Carolina	169	330	499	5,810

During the summer 141 wild ribes were destroyed in the drainage area of Deep Creek. This represented an isolated pocket which was found on the survey during 1944. The work was performed by Mr. Savage and a Park warden. Only two man-days were charged against this work.

COST OF BLISTER RUST CONTROL WORK DURING 1945

During the year a total of \$1,333.62 of Park Service Funds was spent on the work. A blister rust checker and one helper were employed. The men did very good work and considering the topography and ground, made good progress. With the exception of a part of one grid where the strips were run at 5 chain intervals the survey was made at ten chain intervals, representing a 2.5 percent coverage. The men worked out of a Park camp. Some time was lost through the establishing and moving of the camp.

WORK SCHEDULE FOR 1946

There remains a balance of \$382.70 in the blister rust fund and a request for a supplementary allotment of \$3,095.00 has been made to carry the work through June 30. Work plans for the next year provide for the checking of home sites for cultivated ribes in the Cataloochee and Deep Creek watersheds or as many of the home sites in these watersheds as the season will permit; the eradication of wild ribes from approximately 125 acres on Mount Sterling Ridge and a continuation of the resurvey in the Little River watershed. A few sample grids may be resurveyed in the

Abrams Creek watershed, Tennessee Division. From the resurvey of these sample grids as well as the data obtained on Little River, a decision can be made regarding the desirability of a resurvey of the 1940-1941 Tennessee work.

During the next few years, a systematic check should be made of the home sites on the Park, and regardless of the proximity of the white pine, any cultivated ribes located should be destroyed. This work can only be performed during a two to four weeks period of the year and, therefore, a few years will be required to complete the job. At every opportunity additional information should be secured regarding the distribution of white pine at the higher elevations, and information regarding the distribution of ribes, particularly at the lower limits. A tentative plan was prepared for making a comprehensive wild ribes survey of the Park. Further consideration should be given to this, as time and funds permit.

